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Madras Medical Journal.

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# SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

## CHRONIC SOLIDIFICATION OF BASE OF LUNG.

BY

SAMUEL GEE, M.D.

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Just as chronic solidification of the apex of the lung is usually due to tubercle, so chronic solidification of the base is usually due to collapse or cirrhosis.[1] Laennec included both these structural changes under the name of carnification of lung;[2] and although they are distinguished easily enough when the body is examined after death, yet the distinction cannot be made with certainty by examination during life; and hence chronic collapse and cirrhosis are almost the same lesion for the practical physician, and for him the term carnification remains useful to signify that he cannot tell whether he have to do with collapse or cirrhosis.

### I. *Carnification Secondary to Pleural Effusion.*

The commonest cause of this carnification of the base of a lung is chronic pleural effusion; and even when the liquid effusion is absorbed, carnification often remains, either because the pleura is adherent or thickened and tightly enveloping the lung, or because the structure of the lung itself has become cirrhosed. The time when a pleural effusion is quite absorbed

[1] A term first used by Dominic J. Corrigan: "On Cirrhosis of the Lung," *Dublin Journal of Medical Science* for 1838, vol. xiii. p. 266.

[2] He described a good case of cirrhosis under the name of transformation of pulmonary substance into fibro-cartilage. *Auscultation médiate*, 2nd edit., vol. i. p. 227.



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cannot be determined by percussion and auscultation, because the physical signs of pleural effusion and of carnification may be exactly the same. The temperature sometimes helps: if the effusion (chronic effusion) have been attended by fever throughout, cessation of fever commonly marks disappearance of effusion. The chest may be punctured if it be necessary to clear up doubt upon this point.

Very chronic collapse does not necessarily lead to cirrhosis. A boy at the age of eight years had an empyema, which, after having discharged through the chest-walls for four years, closed up, leaving the chest very greatly contracted on that side. He died dropsical at the age of eighteen years. The lung on the affected side was found to be everywhere adherent by means of a very thick false membrane; the lung was everywhere void of air, and yet it blew up perfectly when the false membrane had been partially removed. This collapse had lasted for ten years, and yet it had not passed into cirrhosis.

The physical signs of carnification are only those of solidification and contraction. When a whole lung is affected, the contraction of the chest is sometimes very great; but we have now in mind patients whose disease involves the lower lobe only, more or less. In this case, too, there will be contraction of the chest, but more confined to the situation of the pulmonary disease. The heart will usually be displaced to the same side as the contracted lung. The diaphragm will rise, and with it the liver on one side, and the stomach and spleen on the other. The percussion note will be dull, not always completely so. The breathing sound will be weak simply or bronchial; in the latter case the large tubes are open. When they are dilated the breathing may be cavernous, and attended by cavernous râles. Bronchophony, or its ægophonic variety, may be present. Puncture will reveal no effusion, and yet an effusion there may be, deeply seated, compressing the lung against the chest-walls.

### II. *Cirrhosis Secondary to Chronic Pneumonia.*

Laennec considered carnification to be due to a peculiar form of inflammation of lung. He was mistaken so far as collapse is concerned; but no doubt pneumonia may end in cirrhosis. Why pneumonia is sometimes chronic, and why it sometimes ends in cirrhosis, cannot be explained; the facts, when they occur, certainly do not depend upon the age or weakness of the patient. Nor does chronic pneumonia, however slow in resolution, always set up cirrhosis. A cabman, 42 years old, suffered from pneumonia for more than six weeks,

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and yet the affected lower lobe of left lung was found post-mortem to be still in a state of purulent infiltration.

Cases of chronic pneumonia may be arranged in two classes, according to the course of the fever. Either an ordinary crisis occurs at the usual time, but resolution of the solidification is slow, or the defervescence and resolution are both much delayed.

1. *Critical Defervescence, Slow Resolution.*—A girl of 8 years was suddenly seized on July 2 with the usual symptoms of pneumonia. On the 5th the usual physical signs were noted. On the night of the 5th and 6th a sudden, complete, and final defervescence occurred, but the signs of solidified lung remained, and on the 15th the chest was punctured without result. By the end of August complete resolution had occurred, but the affected side was left much contracted.

2. *Delayed Defervescence, Slow Resolution.*—A man of 20 was taken ill on July 7. The fever did not subside until August 28. The chest was punctured twice without result. On September 13 he was rapidly gaining flesh and strength, but the affected side was contracted, defective in movement, dull to percussion over the lower half, especially behind; the breathing over the same part was very weak, but not at all bronchial; no bronchophony and no râle. He was last seen on September 23, when his condition was much the same.

Cases of apparent chronic pneumonia always raise the question of residual empyema, and inasmuch as the pus is sometimes collected between the lung and diaphragm, or between lobes of the lung, puncture cannot be wholly depended upon as a means of diagnosis. In a case of this kind, a man of 45 years, who was taken ill on August 24, the chest was punctured twice, on September 10 and September 18, without result; yet on September 21 he brought up half a pint of pus, very mucaginous, like ordinary muco-purulent sputum, not offensive. The pus of an empyema sometimes undergoes this mucous change. From this time the patient rapidly mended, and on October 9 there were neither signs nor symptoms of disease.

It will be observed that all the cases of chronic pneumonia which have been cited ended in recovery sooner or later, excepting one fatal case, whose death was due to infecting endocarditis and meningitis. It is remarkable how small is the evidence that pneumonia is a cause of cirrhosis; yet there is such evidence, and a few cases might be collected from medical literature which seem to show that this sequence of events does sometimes occur.

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### III. *Tubercle of Base of Lung.*

Tubercle affects the base of the lung in two ways, either as progressive phthisis, or as ending in cirrhosis. The diagnosis of tubercular phthisis of the base need not be discussed here. The diagnosis of cirrhosis originating in tubercle depends entirely upon a knowledge of the condition of the patient before the disease ended in cirrhosis: there are no means by which tubercular cirrhosis can be distinguished during life from other forms of cirrhosis.

IV.—Often enough cirrhosis of the lung, with dense pleural adhesion, cannot be attributed to any of the fore-named conditions. Syphilis has been regarded by some pathologists as an occasional cause of cirrhosis; for my part, I must confess that I have never been able to satisfy myself that there is such a disease as pulmonary syphilis. Nor is there any very conclusive evidence that inhaled dust can set up cirrhosis apart from tubercle.

Cirrhosis and phthisis are apt to be attended by a profuse purulent expectoration, which is sometimes fetid, sometimes not. The same kind of sputum may be due to an empyema which has opened into a bronchus through an ulcer of the pleura and lung; and inasmuch as an empyema of this sort cannot be distinguished from cirrhosis by physical examination alone, it becomes necessary to explore the chest by puncture. A fine needle, used with care, cannot do harm; but a larger trocar is not so safe. Out of possible accidents following its use, this may be selected for notice, namely, an empyema is sometimes so deeply seated that between it and the chest-wall is a layer of carnified lung which must be pierced before the empyema can be reached by the trocar. Yet it is a proceeding full of danger to let offensive and virulent pus into the condensed lung: gangrene of a portion of the lung will ensue, and this result may cost the patient's life. Wherefore, if it be probable that we have to do with a deeply-seated empyema, it is much safer to make such an opening through the chest-walls, that pleural adhesions can be broken down and the cavity explored by the finger.

A profuse expectoration is often associated, not with empyema, but with chronic consolidation of the base of the lung, cirrhosis or phthisis. In either of these diseases it may be useful to operate if physical examination of the chest point to the existence of cavity. With regard to phthisis, nobody would think of operating

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unless the disease were inactive, arrested, and the cavity enclosed in callous tissue more or less like that of cirrhosis. With regard to cirrhosis, the auscultation signs of cavity are due either to a single large bronchus dilated into a sac, or to many tubes moderately dilated; and these two states cannot be distinguished by physical examination of the chest. An operation will do no good if the dilatation affect many tubes, and therefore until we have operated we cannot say whether the operation will relieve the patient or not. The object of the operation is to drain the cavity, and the benefit of drainage is threefold: the patient is relieved from cough and expectoration, also from fever and colliquative symptoms (sweats and diarrhœa) due to septic absorption from the cavity, and the cavity is put into the most favourable condition for contraction. The operation consists in removing a portion of a rib over the supposed cavity, puncturing the lung with a trocar and cannula, and, if a cavity be found, enlarging the wound of the lung and inserting a drainage tube. This operation is performed under the belief that the pleural cavity is obliterated by adhesions, over the lower part of the lung at least; and this is usually the case; but should it not be so, we shall give the patient pneumothorax,—an accident which happened to one of my patients, and which increased her distress for a week or two; but the air in the pleural cavity soon disappeared, and in the end she was much relieved by the operation, and left the Hospital comparatively free from the cough, expectoration, dyspnœa, and hectic fever, for which she had been admitted.

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ON THE

# DIFFERENTIAL DIAGNOSIS OF NEW GROWTHS

AND

# INFLAMMATORY ENLARGEMENTS OF THE BONES.

BY

HOWARD MARSH.

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Those who have most often made the attempt will be the first to own how difficult it sometimes is to say whether an enlargement of a bone is inflammatory or due to a new growth. Yet the question is one of great importance, for it generally presents itself in reference to such large bones as the femur, tibia, or humerus, and involves the consideration whether either amputation through the bone higher up or disarticulation at the joint above should be performed.

There have lately been some cases in the wards which will illustrate this subject, and other examples are found in the Museum.

CASE I.—Last year a man, aged 28, who came as an out-patient, had a swelling of the size of a hen's egg situated at the posterior border of the tibia, at the junction of its uppermost with the middle third. It was prominent, clearly circumscribed, irregular, and indistinctly lobed, firm, and quite inelastic. It had been slowly increasing in size for nine weeks, and was neither painful nor tender on pressure. The tumour was just such a swelling as might be due to a circumscribed periostitis, either syphilitic or tubercular, with heaping up of inflammatory products not yet softened; but it also bore a very close resemblance to a periosteal sarcoma. My first view, though held with considerable doubt, was that the disease would prove to be tubercular; but as it was possibly syphilitic, I prescribed five grains of iodide of potassium three times a day, and a few

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days later, increased the dose to ten grains. This medicine produced no effect, and I then, reverting to the probability of tubercle, gave the patient quinine and cod-liver oil, and advised horizontal rest for the limb. As the swelling, however, still increased (chiefly at the back rather than at the inner border of the bone, so that it became less easy to examine it), and as there was now some œdema of the leg below, as if there was pressure on the deep veins, but no redness of the skin or other evidence of inflammation, I grew more suspicious that the case was one of sarcoma, and took the patient in for consultation. Several members of the staff saw the swelling, and, though all advised exploratory incision as a matter of precaution, the great majority looked upon it as in every probability a sarcomatous growth. A few days later, therefore, having applied an Esmarch's bandage, I exposed the tumour.

The periosteum and the structures over it were condensed and matted together, and on cutting into the swelling I found that it was a thick-walled abscess containing two or three drachms of caseous pus. The deceptive character of this swelling up to the moment it was cut into was complete.

CASE II.—Some years ago a boy, aged 9, was in the Hospital for Sick Children, with enlargement of the right superior maxilla. The swelling had gradually formed in the course of the previous four months; it projected forwards, and also downwards, so as to cause bulging of the hard palate; it was as firm and hard as bone; the skin over it was normal. The child had complained of little or no pain, and there was no tenderness on firm pressure. Those who saw the patient agreed that the swelling was solid, and either osteoma or osteo-sarcoma, and the case seemed exactly similar to one in which I had removed the superior maxilla in a boy aged 8 for osteoma, at St. Bartholomew's Hospital a few months before. Two days later I proceeded to remove the bone. Having divided the upper lip, and carried the incision up along the side of the nose so as to expose the tumour, I was prompted, by a fortunate inspiration, to do what should certainly have been the first step in the proceeding, and I perforated the swelling. I then found that it was a collection of pus in an enlarged but still thick-walled antrum.

CASE III.—A boy, aged 11, was recently admitted into St. Bartholomew's Hospital, who seven weeks before had fallen upon his right knee. The injury seemed slight, and the boy complained of no pain until the next day; then some liniment

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which was applied at once relieved him. From the time of the accident the lower third of the femur slowly enlarged. On the boy's admission the femur just above the condyles measured two and a quarter inches in circumference more than the right. The swelling involved the shaft on all sides, so that the whole bone was enlarged. The enlargement, however, was especially marked on the posterior aspect, and the popliteal space was to a great extent filled up, while on the inner side of the space a large nodular mass could be felt projecting beyond the surrounding level. In an upward direction the enlargement terminated somewhat abruptly, leaving the shaft immediately above of its normal size. The swelling was everywhere of bony hardness, the skin over it was normal, except that some of the cutaneous veins were distended. There was slight effusion into the knee-joint. The temperature in the axilla was 99° in the morning and 100° in the evening.

In this instance I formed the opinion that the swelling was a periosteal sarcoma, mainly on the ground that the enlargement, everywhere hard and solid, almost filled up the popliteal space, and in one part formed a prominent lobe or boss, as if the disease was developing with special activity at this spot. The size which the enlargement had attained in the course of seven weeks, the fact that there had been very little pain, that no suppuration had occurred, and that the skin and soft parts were natural, were points which all seemed to indicate a new growth. Other features of the case will be discussed in the remarks that follow. A few days later an Esmarch's bandage was applied, and the swelling was exposed by a free incision, and carefully examined. The superjacent tissues seemed in a natural condition, and no evidences of inflammation were met with. The bone where it was exposed in the lower part of the incision was found to present a very irregular and uneven appearance, due to numerous small, low-crowned, hob-nailed or tuberous masses projecting from its surface, while just above it was smooth and almost normal, and the unaltered periosteum was readily stripped off it in a uniform layer. As these features seemed to confirm the diagnosis of sarcoma, amputation was performed. On examination afterwards, a longitudinal section of the bone having been made, it was found that the disease was after all only inflammatory.

In the centre of the swelling was a sequestrum derived from the compact substance of the original shaft, and the enlargement was due to the profusion with which new bone had been deposited in an irregular manner by the periosteum. The cavity which contained the sequestrum was on all sides deeply walled

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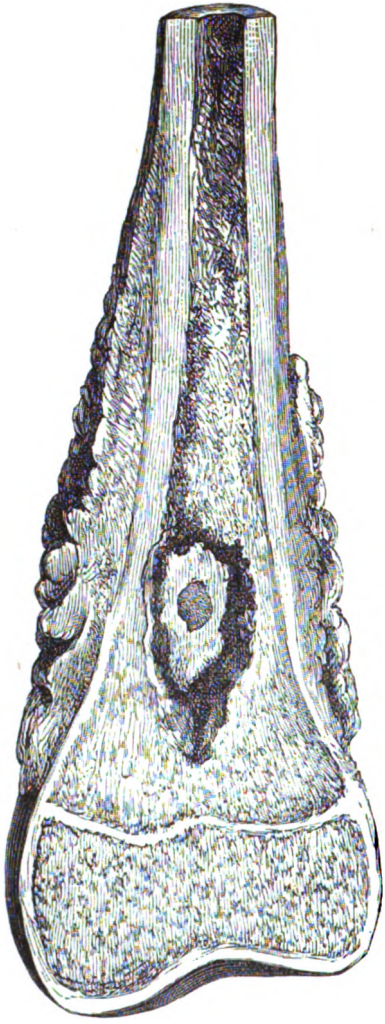
in by firm bone, except that there was a very narrow passage, only large enough to admit a probe, which led from it through the encasement of new bone into the popliteal space. At the external orifice of this passage a bead of pus, the size of a pin's head, was seen, indicating that suppuration (the evidences of which would soon have declared themselves externally) had just commenced.



Case IV.—In the Museum is a specimen (258A) of necrosis of the femur from a case with the following history. A man, aged 29, was admitted with a fusiform enlargement of the middle third of the shaft of the femur. Many of the staff saw the case, and differences of opinion were expressed as to the nature of the disease, some thinking it was a new growth, others that it was inflammatory. To determine this question, the surface of the femur was exposed by a free incision, and a careful examination was made, with the result that all who were present came to the conclusion that the disease was sarcoma. Amputation was then performed. When the specimen was dissected, it was found that the case was one of necrosis. Imbedded in a large mass of new bone was a loose sequestrum, derived from the compact tissue of the original shaft. The new bone was deposited so as to constitute a somewhat irregular swelling.

Case V.—Mr. Morrant Baker has recorded in the *Medico-*

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*Chir. Trans.*, vol. lx., a case which forms a very valuable contribution to the group under discussion. A man, aged 20, had been quite well till about ten weeks before his admission into the Hospital. He then had deep-seated pains in the left thigh, soon followed by slight swelling. Both the swelling and pain gradually increased, and pain at night became severe. Six weeks later, as the patient was walking across his room, the femur broke opposite the middle of the swelling. On admission into the Hospital, he was found to have a large tumour of the thigh extending from the trochanters to the condyles. The integuments were natural, and so, apparently, were the soft parts down to the tumour; there was neither redness of the skin nor œdema of the surface, nor deep-seated elasticity. The temperature was below 100°. No glands were enlarged. Many of the staff saw the case, and all regarded the disease as malignant. Mr. Baker, therefore, performed amputation at the hip-joint. The patient made a good recovery. On dissecting the limb, there was no inflammatory condition evident. No abscess or sinus, and no pus; but a longitudinal section through the swelling showed that there was necrosis of nearly the whole shaft of the femur. The enlargement was due to the deposit of somewhat bulky callus. The periosteal sheath of new bone extended from the lesser trochanter to the condyles.

REMARKS.—It will be seen that here are five cases, all of which were carefully examined and fully considered, and yet in all of which the affection present was believed to be malignant, when, as a matter of fact, it was inflammatory. In two, the mistake was made even after the bone had been exposed by an exploratory incision. In two others, a similar mistake was avoided only by direct exploration. With these cases before us as a reminder of the difficulties that are often met with, it may be useful to examine the evidence which must be depended upon in making a diagnosis between new growths and inflammatory enlargements of the bones, and to see how far each of the points that may be present is, on the one hand reliable, or on the other deceptive, or, at the best, inconclusive.

1. An important first step on entering upon the investigation is to recollect that inflammatory enlargement of any of the long bones is, at all events in subjects under twenty, much more common than a new growth. I should be inclined to say in the proportions of at least three to one. When I was surgeon to the Hospital for Sick Children, I remember several cases which were sent with, as it was said, malignant disease of the femur, but of which the large majority proved to be merely

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inflammatory (tubercular osteitis): and in his work on the Surgery of Childhood Mr. Holmes remarks that he has known at least three cases in which amputation at the hip-joint was contemplated for an affection of the femur which turned out afterwards to be inflammatory. This element of what may be termed numerical probability is one of the main principles of a sound diagnosis. The larger his experience, the more unwilling does the judicious surgeon become to regard a case as something very rare, instead of something that is comparatively common, unless he is driven by clear evidence to that conclusion. It is often safer to trust to a strong general probability than to appearances which, so far as they go, point to some rare disease. It is obvious that this method might easily be pushed too far. Yet to remember that the chances are, say, three to one against a particular view, will often act as a useful check, and avert the mistake of attaching undue weight to symptoms or appearances which, when they are critically estimated, are seen to be of little substantial significance, or which will equally well fit in with some alternative conclusion.

In the present case, the fact that numerical probability inclines strongly to inflammatory enlargement as against new growth must be kept well in view.

2. At first sight a *distinct history of injury* would seem to indicate that an increasing enlargement of a bone was probably inflammatory. This inference would often, but by no means always, be correct, for many remarkable cases have been recorded in which a new growth has appeared with startling rapidity in a part after injury. Sir James Paget has related an instance in which a malignant tumour around and within the fibula attained a large size (and was removed by amputation) within eight weeks after a strain, or perhaps fracture of the bone.

3. *The shape or conformation of the swelling* is often no guide. The swelling which is symmetrical, so that it involves the bone equally on all sides, shading off gradually into the shaft above and below, and presenting no lobes or low-crowned bosses, is more likely to be inflammatory than a new growth; but, on the other hand, a new growth, instead of being, as is usually the case, lobed, nodular, or irregular, and involving the bone only on one aspect, and leaving other parts free, may be symmetrical, fusiform, and smooth; while an inflammatory enlargement may involve the bone chiefly in one direction, and may, as in Case III., present irregular tuberose projections strongly resembling the jutting lobes of a new growth.

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4. *The Consistence of the Swelling.*—Inflammatory enlargements are often in this respect precisely like osteo-sarcomata—firm and inelastic, dense like bone, and with no softness or sense of yielding anywhere. They are, in fact, formed of material very closely resembling callus; while, conversely, a rapidly-growing sarcoma may be so elastic that it feels like a soft inflammatory swelling. A year ago I met with a case in which a new growth involving the condyles of the femur very closely imitated pulpy tubercular thickening of the synovial membrane of the knee; and the resemblance was increased by the presence of some fluid in the joint, due no doubt to impeded venous circulation. But, in spite of these resemblances and the chances of error which they involve, a very careful study of the consistence of the swelling is of great importance, and will sometimes give the only clue to a correct diagnosis. The whole superficies of the swelling must be minutely searched over for any circumscribed or isolated yielding, or any soft or tender spot; for usually, except in its most chronic examples, ostitis sooner or later suppurates, and matter escapes through a small hole in the new bone, and gives rise to a "soft spot" or a "tender spot."

In Case III. suppuration had just commenced, and a bead of pus had reached the surface of the bone. In two or three days it would have given rise to the "soft spot" by which its presence would have been clearly indicated.

5. *Rate of Growth.*—This throws no light on the question of diagnosis. In both osteo-sarcoma and ostitis the rate of increase of the swelling varies widely in different cases. In both alike it may be either slow or rapid. Thus, in Case III., enlargement due to ostitis and the deposit of new bone had become very marked within seven weeks, and in Mr. Baker's case a large tumour, due entirely to the formation of new bone, had been developed by an ostitis which had been in progress only six weeks. On the other hand, new growths have, in some instances, supervened so quickly after injury as to have attained a large size within three or four weeks. In short, rapidity of enlargement is a phenomenon often observed in both ostitis and malignant disease. As little can be inferred if the increase of swelling is slow, for in ostitis and osteo-sarcoma alike, especially if the latter is central, three or four months or more may elapse before enlargement becomes considerable. If, however, careful observation shows that the enlargement is not increasing, and, *a fortiori*, that it is diminishing (independently of any mere decrease in the amount of accidental swelling of the soft parts due to position, and now removed because the position of the

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limb is changed), this circumstance would, of course, be suggestive of ostitis rather than of new growth.

6. *Condition of the skin and deeper soft parts over the swelling.*—This affords no indication that can be trusted. The skin may be turgid and dusky, and the subcutaneous veins distended and tortuous over an inflammatory enlargement, just as is often the case when the disease is malignant; while in both Case III. and in Mr. Baker's, although the disease was inflammatory, the surrounding soft parts seemed healthy, and were neither swollen nor brawny, or indurated or otherwise changed. Even when an exploratory incision was made down to the bone in Case III., there was no evidence of any inflammatory change. In many instances of new growths also the soft parts have their circulation uninterfered with, and remain in a perfectly normal condition.

7. *Pain.*—In some instances pain is so constant and severe, and so distinctly exacerbated at night, that it is strongly suggestive of ostitis; but generally it is a symptom to which little weight can be attached, for in some cases of ostitis it is insignificant in its amount, or even entirely absent, while in some cases of new growth it is severe. All that can be safely held, I think, is that pain is much more distinctly a symptom of ostitis than of a new growth in bone.

8. At first sight it might be thought that *the body-temperature* would afford an efficient guide in the diagnosis between malignant disease and ostitis, except when the latter is chronic. But this is not the case. In the first place, the temperature may remain normal, although the disease is inflammatory, and is producing swelling at a rate which, if taken alone, would be strongly suggestive of malignant disease. While, on the other hand, a considerable rise of temperature may be present in cases of malignant disease.

In a former paper[1] I have mentioned two cases of periosteal sarcoma in which the temperature rose in one to 102° and in the other to 103°; and an instance in which, in sarcoma of the kidney of a child, the temperature was as high as 102°. The rise in such cases is probably the result of tension produced by the rapid growth of the tumour.

Thus far it is clear that, when every available feature of the case has been carefully weighed, the question whether the disease is inflammatory or malignant may still remain a doubtful one. Different reservations which have to be made so whittle down what at first seems to be good evidence, that no trustworthy conclusion (in many instances) is reached. The

[1] St. Bartholomew's Hospital Reports, vol. xxiii.

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appeal must therefore be to a direct inspection of the swelling when it has been well exposed by a sufficiently free incision. This is a step which—however clear it may appear that the disease is malignant—ought not to be neglected. In Mr. Baker's case no one who saw the swelling expressed any doubt that it was of a malignant nature; yet it was inflammatory. In two other cases in which the view that the disease was malignant had been endorsed by general consent, the fact that it was inflammatory was ascertained only when an incision had been made. The difficulty of diagnosis is but the parallel to that which often presents itself in the case of swellings of the breast, testis, and other soft parts, where a neglect of an exploration has sometimes led to the removal of organs which, had greater caution been used, might have been preserved.[1]

But it must always be remembered that even when an incision has been made and the surface of the tumour critically examined, an error may still be committed. In Case IV. such an examination was made, and though the disease was inflammatory, there was nothing to indicate that it was so: no pus or recent lymph, and no inflammatory induration, cicatricial thickening or matting of the tissues together, and in Mr. Baker's case dissection of the limb after removal showed that all the soft parts down to the bone were perfectly healthy, for the disease was central—that is, it was entirely covered in and masked by new bone. The complete manner in which the evidences of inflammation may be obscured is well shown in the figure, p. 10.

But the difficulty of diagnosis may take another form. When the bone is exposed by a free incision, its surface may present obvious changes; but these may be so deceptive that, though they are the result of ostitis, they may be mistaken for the indications of a new growth. This mistake was made in Case III.

After an Esmarch's bandage had been applied, and a free incision made and the parts well retracted, what we saw misled both myself and one of my colleagues, than whom no one is

[1] The difficulty of deciding whether a swelling is inflammatory or malignant was well illustrated many years ago in the following case. I was asked to see a little boy of 5, with an enlarged testis. I expressed the view that it was malignant, but was then told that, an hour before, Mr. Curling had pronounced it tuberculous. Wishing for a consultation, I went with the parents to Mr. Curling's house. I then found that after the patient left him he had written a letter, which he now handed to the child's father, and in which he said that, on thinking the case over, he had come to the conclusion that the disease must be malignant. We then examined the case together, and he still believed that his second opinion was the correct one. Yet the event showed that the disease was after all tuberculous.

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more competent to pronounce an opinion on any point of surgical pathology or morbid anatomy.

There remain three further points of evidence that must be taken into account if the case still remains open to doubt. Instead of being content with merely exposing the surface of the swelling, it may be advisable to cut deeply into its substance with a narrow-bladed chisel, and remove a substantial wedge-shaped block, say an inch long, a quarter broad, and three-quarters of an inch deep. If the case is inflammatory, the block will present the structure of cancellous bone—that is, it will be more or less porous or trabeculated, not dense and amorphous, like a section of chalk; nor would it present anything of a fibrous texture, like a firm sarcoma, or any appearance of an admixture of cartilage.

A microscopic examination may be made. But such an examination, if it is undertaken, so to say, roughly and at the moment, is quite untrustworthy. Indeed, in Case IV. a portion of the swelling when put under the microscope was erroneously thought to have the structure of a new growth. To be conclusive, the examination must be made by preparing a section and staining it in the usual manner. This will take three or four days, but that is a matter of no importance if, as should of course always be the case, the wound is strictly guarded against infection.

In the next place, the swelling may be carefully watched and measured at short intervals, to see whether it is still growing, or is, on the other hand, stationary, or even decreasing. The fact that a swelling is still increasing is obviously no evidence that it is a new growth; but should it be clear that it is diminishing, this fact may be allowed considerable weight as evidence that the disease is inflammatory; for while, in the case of a new growth, adventitious swelling, due to position and other accessory causes, is, as a very general rule, but slight, in inflammation it is considerable, and will therefore subside to a marked extent when the limb is kept in a favourable position and at complete rest.

In these remarks I have endeavoured to review the various data which may be appealed to, and to show that one and all of them may, unless the greatest caution is used, be deceptive. I am afraid I may seem to have proved that a correct diagnosis is sometimes impossible. I have no wish to take up such a position; but my object has been to show that it is only by the exercise of great care and circumspection that mistakes can be avoided.

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# THE INCISION IN ABDOMINAL SECTION.

BY

HARRISON CRIPPS.

Provided the incision be in the right direction, it is immaterial through what portion of the abdominal wall it is made. I have opened the abdomen in a large number of cases in the middle line for ovariotomy, hysterectomy, obstruction, &c., and over a hundred times in one or other of the flanks for colotomy, and from this experience know that healing takes place as quickly and soundly in one portion as in another. Incisions in either flank, even if made at right angles to the muscular fibres, do well; but this is not the case on the front of the abdomen in the middle line. All incisions here should be made in the long axis of the body, transverse cuts being avoided. The position and action of the recti muscles afford an explanation. If cut transversely, their action causes the wound to gape, while the protection they afford to the abdominal contents during coughing and vomiting is impaired. The valuable aid of these muscles in preventing gaping and extrusion is often illustrated during an operation, for should the patient vomit or strain, the recti tend to close the wound by the approximation of their edges.

*Preparation of the Patient.*—The advantage of operating with undistended intestine has long been recognised, and save in cases of urgency or intestinal obstruction, a little care for two or three days will probably ensure a flaccid intestine. A simple diet of meat, milk, and farinaceous food, avoiding fruit and vegetables, should be taken, while half an ounce of castor-oil should be ordered early in the morning of the day preceding that of operation. On the morning of the operation a simple enema of a pint of warm water is administered, and the nurse must see that it all comes back. If the patient's general condition warrants it, a thorough soap-and-water hot bath should



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be given for two consecutive nights before the operation. Should this not be admissible, the abdomen must be thoroughly washed with soft soap and water followed by a good bathing of warm 1 in 40 carbolic lotion. After the washing the abdomen should be covered by a light dressing of clean gauze, no waterproof protection of any kind being used, which only confines the perspiration and keeps the part moist. This protection of gauze is specially necessary in colotomy cases, for here there is generally a fetid rectal discharge, which is very tenacious, and particularly liable to contaminate the skin. The dressing should only be removed after the patient is on the table.

*The Incision.*—In making the cut through the skin, the knife should be held as horizontal as possible, for it cuts far cleaner in this way than when held perpendicularly. If the abdominal walls be distended, as is the case in ordinary ovarian tumours, the soft parts fly asunder as the knife passes over them, and the incision is made with ease; but this is not the case when the abdomen is empty and flaccid, as often happens in colotomy. Here much care is required to prevent the subcutaneous structures being irregularly cut, the muscles being especially liable to be minced. This can be easily avoided by getting the assistant to lay the hands flat on his side of the abdomen and pressing with sufficient firmness to pass the abdominal contents over to the operator's side. This at once puts the walls that are being divided slightly on the stretch, and greatly facilitates the even division of the muscles. The successive layers are divided by the knife being drawn from the top to the bottom of the incision till the peritoneum is reached. This is best divided by the operator taking hold of a small portion with dissecting forceps, and the assistant doing the same on his side. It is thus slightly lifted off the subjacent structures and opened by a small cut between the forceps. The finger can be now gently passed within, and the remainder of the peritoneum divided with scissors. In ordinary abdominal section, the peritoneum is best opened to the full length of the skin incision, but in colotomy it must not extend quite into the angles. The utmost care should be exercised not in any way to dissect the various layers the one from the other, for this materially diminishes the vitality of the cut edges, and, moreover, forms pockets in which débris may collect, and give rise to subsequent suppuration.

It is advisable, in inguinal colotomy, to divide the fascia transversalis and peritoneum both together with scissors. If this is not done, the peritoneum, being so loosely attached to

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the fascia, is apt to get detached from it. If they are divided together, the needle and suture can be passed through them both when the peritoneum is being raised to the skin. The fascia is much stronger than the peritoneum, which, if the abdominal walls are thick, is apt, if alone included in the suture, to tear.

The possibility, both in colotomy and ovarian cysts, of the peritoneum being adherent to the intestine or cyst-wall must be borne in mind, and it is by no means easy to distinguish where the one ends and the other commences. In ovariotomy the rule laid down by Sir Spencer Wells many years ago, of extending the incision upwards beyond the adhesion before commencing the separation, is the safest plan. In inguinal colotomy an adhesion between the peritoneum and the intestine is very puzzling, and it must be sufficiently separated to establish the identity of the large intestine.

Before opening the peritoneal cavity, bleeding vessels in the walls of the incision are clamped by pressure forceps. These should be put on by the operator, who, being on the right side of the patient, and using his right hand, can put them on so that the handles lie downwards. If the assistant puts them on (unless he uses his left hand), the forceps will have to be turned round after the vessel is seized—a clumsy manœuvre, which unnecessarily lacerates the fat. Care should be taken not to include the skin margin in the forceps.

The length of the incision must be adjusted to the work in hand. In colotomy and cases of simple cyst, a three-inch incision is sufficient. Should the case be an exploratory one, and should it be necessary to pass the whole hand into the abdominal cavity, the cut must be from $4\frac{1}{2}$ to 5 inches long. If an attempt be made to pass the hand through too small an opening, the peritoneum is apt to be detached and the sides of the incision bruised. Although it is a good principle to make the incision no longer than necessary, surgeons will differ as to what they consider this to be. For my own part, I like plenty of room, and consider the advantages gained, both for diagnosis and operative treatment, more than counterbalance the possible harm coming from a lengthy incision. Half the secret of successful surgery is to see what you are doing, and not violently to drag on tissues either morbid or healthy. All solid tumours require long incisions, and so do cysts which have to be shelled out from the broad ligament or pelvis.

Perhaps, however, there is no class of case where the value of a long incision is better illustrated than in an exploration for intestinal obstruction. In an abdomen tightly distended with

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inflated intestines, to find the site and cause of obstruction through a small incision is seldom practicable. Moreover, I am not in favour of the plan of drawing out the intestine bit by bit, and passing it in again as a means of examination. The process is long, and every inch of the intestine gets manipulated and bruised. You do not know whether you are going upwards or downwards, or towards or from the obstruction. If the obstruction be found and be of long standing, the tension exerted in pulling up the bowel, though apparently slight, is sufficient to tear the gut at the nipped and softened portion. Lastly, if the obstruction is found deep in the abdomen, how can it be carefully examined and treated through a two or three inch incision? Of course, in these cases it is proper first to make a small incision, and see what can be felt with the finger; but if this be negative, at least a five or six inch incision should at once be made; nor would I hesitate to extend it even further if a better view was wanted. The distended intestine immediately endeavours to crowd out of the wound, and why surgeons, as is often the practice, should make every endeavour by sponges, pressure, &c., to keep it in, is not easy to understand Surely the diagnosis and necessary treatment is sufficiently difficult when the intestines are outside the abdomen, while if kept within, they crowd upon the operator's fingers, and fill the limited space in which he is anticipating the performance of an operation requiring the greatest delicacy and care. Such a procedure seems to me on a par with the workman who attempts to solder the cistern without first getting rid of the water. No doubt the anxiety of the surgeon to keep the intestines within arises chiefly from the fear that if let out he may not be able to return them. This fear is by no means imaginary, as any one who has tried to get a yard or two of distended intestine back knows; but, if necessary, it can easily be returned by a simple and perfectly safe means. The plan I adopt is as follows:—

A large folded towel wrung out in hot water is laid half across the abdomen. All the distended intestine is allowed to come out of the abdomen and lie on this towel, and is immediately covered by another moist, warm, folded towel, and it should be the sole duty of a nurse or assistant to renew this frequently to keep the intestines warm. The surgeon now will find he has plenty of room to search for and treat the obstruction. When the time comes for returning the distended intestine, the abdominal incision, if long, is reduced to about four inches by suturing. If a difficulty arises in reducing the gut, the patient may be turned slightly to one side, a loop of the distended intestine lying outside the abdomen is drawn through

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a slit in a folded towel or thin waterproof sheeting, and then opened by a clean incision a quarter of an inch long. By gentle kneading and pressure the whole of the fluid and gaseous contents of the distended bowel can be quickly expelled, the part thoroughly washed, and the tiny incision closed with fine Lembert sutures. The intestine now collapsed can be easily returned. This evacuation serves a double purpose, enabling the intestine to be easily returned, and at the same time giving complete relief to the distension.

*Sutures.*—Many varieties of material have been employed for closing the abdominal wound. Except for inguinal colotomy, silk-worm gut is probably the best material. This is bought under the name of salmon gut, but the cheap variety that answers admirably all purposes of surgery would certainly be indignantly discarded by the salmon-fisher. A perfectly reliable gut for surgical purposes can be bought at a cost of two to three shillings a hank, while three to four pounds is the price of a really reliable article for salmon-fishing.

The sutures are passed through the whole thickness of the abdominal walls, including skin, muscles, and peritoneum. Some surgeons use a suture threaded at both ends, each needle being passed through the peritoneum from within the abdomen out through the muscles and skin. It is simpler, however, and more expeditious to use one needle only, which is passed from without inwards on one side, and from within outwards on the other. The distance of entering the needle from the cut edge should be half an inch, while the distance of the sutures from each other may be about three-quarters of an inch. If closer, the edges have too much of their blood supply cut off. All the sutures are best passed before tying them up, unless the incision is very long, when a few of the upper ones may be tied at once to prevent prolapse of the intestine should the patient strain or vomit. The tightness to which the stitches are drawn is of some importance; it should be only just sufficient to bring everything into opposition, for if tied too tightly the tissues are strangulated. If silk be used, the single reef knot does very well; but if gut be used, it is better to interlace the first half of the knot twice, which effectually prevents it slipping as the second half is completed. If not drawn too tight, the silk-worm gut, even if left in for a long time, produces practically no irritation. The alternate stitches are usually removed on the eighth day, and the remainder three days later. If the wound is very long, or the patient troubled with cough, it is advisable to leave the sutures longer still. In inguinal colotomy, where it

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is necessary to close the abdominal cavity by stitching the intestine to the skin and parietal peritoneum, the very finest possible silk should be used.[1] The needle is passed through the skin and parietal peritoneum, excluding the muscles, and then through the peritoneal coat of the bowel, including also part of the thickness of the muscular coat, but taking special care not to perforate the mucous membrane. The sutures are placed about the fifth of an inch apart, and as close as possible to the skin edge. The last suture at each end is an important one; this is passed through the skin and peritoneum on one side, then through the outer coat of the bowel, and lastly again through the peritoneum and skin at the opposite side. When tightened, the bowel is securely fixed in the angle of the wound. By using a very fine silk, the ends can be cut off close to the knot. This disappears, and there is nothing of the suture left which requires removal.

*Dressings.*—So long as these are soft, clean, and dry, the actual material used is of secondary importance. A few layers of soft carbolised gauze or sterilised lint are laid in strips, two inches by seven, across the wound at right angles; for cut thus into narrow strips the dressing lies smoother and closer than when put on in larger pieces. Over the gauze is laid a single moderately thick layer of cotton-wool about ten inches square. I never use strapping till after the sutures are removed, but have five strips of domet or flannel, five inches wide and four to five feet in length. These are arranged as a many-tailed bandage, but not sewn together, and their length allows them to cross over in front, and go well round on either side. For some time I used to moisten in carbolic lotion the pieces of gauze in contact with the wound, but after trial consider the dry dressing greatly superior. Any moist surface encourages decomposition far more than a dry one. Dry a piece of meat in the sun, and it will keep sweet, but decomposes quickly on being moistened.

"*Hamlet.* How long will a man lie i' the earth ere he rot?
*Gravedigger.* He will last you some eight or nine year; a tanner will last you nine year.
*Hamlet.* Why he more than another?
*Gravedigger.* Why, sir, his hide is so tanned with his trade that he will keep out water a great while, and water is a sore decayer of your dead body."

The dressing of a colotomy wound requires some modifica-

[1] Sufficiently fine silk cannot be bought, but can be made by unravelling the finest that can be obtained into its three primary strands.

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tion, for if any dressing be applied direct to the exposed bowel, in forty-eight hours it becomes firmly adherent from the granulations growing into it. In colotomy a piece of gutta-percha tissue, two inches by four, is laid directly over the exposed bowel, and the dressings applied external to this. Firm pressure is here essential, otherwise, if the patient vomits, there is a risk of the gut being torn away from the sutures, and of small intestine prolapsing. A firm conical pad of several layers of gauze and cotton-wool is placed directly over the gutta-percha tissue, and plenty of cotton-wool placed over the whole front of the abdomen to prevent this pad from slipping. Sufficient pressure cannot be obtained by a many-tailed bandage for colotomy cases, and it is much better to use a flannel roller bandage, six inches wide and eighteen feet long. This is applied as firmly as possible, and then a second similar bandage is put on over the first, remembering to carry the roller round in an opposite direction to that first employed. If this is not done, there is a tendency for the conical pad to be drawn off the wound. A nurse should sit by the patient, and be directed to place her hand and press firmly over the wound each time the patient vomits. The bandage, if complained of as being too tight, can at once be made comfortable by giving it a few snips with scissors over the hips on either side.

A trouble that occasionally follows abdominal incision is a hernia through the cicatrix. One of the causes of this is allowing the patient to get about too soon without adequate support to the abdomen. So long as the patient retains the recumbent position, there is practically but little distensile force from the viscera. In the upright position the pressure is considerably increased. All scar tissue, in its earlier days, is comparatively soft, and will slowly yield to anything like constant pressure; on the other hand, after a while, it becomes one of the firmest and least yielding structures in the body.

A carefully made abdominal belt will be sufficient protection after the first few months; but for the first three months, if the incision has been of any length, it is most desirable that the patient should apply three or four turns of a thin roller bandage, five inches wide, round the abdomen firmly on rising in the morning. Such a bandage always fits more accurately, and gives firmer support than any other appliance. The patient should be enjoined to keep the recumbent position as much as possible, and avoid any exercise that causes undue action of the abdominal muscles. A little patience and care in this respect during the first few months, while the cicatrix is soft, is well repaid by allowing it to become permanently firm and unyielding.

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# GRAVES' DISEASE.

## NOTE ON THE USE OF LEITER'S TUBES TO THE PRÆCORDIUM.

BY

ARTHUR MAUDE.

I have had such satisfactory results from the use of this method in two of the cases I reported in the last volume of the Reports, that I add this note on the procedure.

Cold applied to the thyroid or to the præcordium has been in use many years. But applied to the thyroid, it does not appear to be of any value, and has been practically abandoned.

Cold was first applied to the præcordium by Aran, and has been much employed by French physicians. M. Charcot[1] speaks very highly of it, only having abandoned it in favour of electrical treatment. It has the advantage of cheapness, and that it can be safely and easily employed by the most ignorant person, even in poor country practice.

Ice bags were originally used, but a large-sized rectangular Leiter's coil is the best apparatus. Let this be applied at first for twenty to thirty minutes morning and evening, the time of application being gradually increased until the coil is worn for some hours daily. The pulse rate and feeling of distress are invariably assuaged for a time, and the improvement becomes more prolonged as the treatment is continued.

Many months are necessary for anything like permanent improvement. The cases I selected were very severe ones, one being quite bedridden and unable to stand at all; but both, after six months' continuous treatment, are able to get about and perform some household duties; all drugs were suspended.

In applying the coil continuously, we must bear in mind that nephritis is no imaginary danger,[2] and it should not be employed

[1] Leçons du Mardi, tome i. p. 183.
[2] Douglas Powell, Diseases of the Lungs, 3rd edit., p. 147.

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if there is previous albuminuria. In all cases the urine must be examined periodically during the treatment.

## Note on Surgical Interference in Graves' Disease.

Having directed my attention to the wide literature[1] of this disease for some time, I have collected several cases of thyroidectomy and other operations for its relief, and have thought it of value to bring them in a condensed form before the notice of English surgeons.

Operations which have been practised are—

1. Removal of part or the whole of the thyroid.
2. Ligature of the thyroid arteries.
3. Tracheotomy for urgent dyspnœa.
4. Nerve stretching.
5. Removal of the inferior turbinated bones (or their cauterisation).

The cases of thyroidectomy I have thrown into a tabular form.

The operation is undoubtedly a formidable one in such cases, and must be considered as still quite on trial, only perhaps justifiable when there are urgent symptoms of pressure on the trachea, which is very rare. But at the same time the results are fairly encouraging, as all the cases were severe, and the improvement, when produced, was maintained. at any rate for some time.

But longer experience is needed to show if the cure was permanent, or if myxœdema ensued; and we are scarcely as yet in a position to accept thyroidectomy as a regular mode of treatment.

In addition to the cases I have found, I am informed that Professor Kocher, of Berne, has also removed the thyroid; but I am unable to find any published report.

[1] I find 627 papers on this disease from 1862 to 1891.

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| Surgeon. | Reference. | Operation Performed. | Result. |
|---|---|---|---|
| Lister, Sir J. | Trans. Edin. Med. Chir., 1886-87. Brit. Med. Journal, July 9, 1889. | Removal of bulk of thyroid in 1877. | Alleviation in a few weeks. Improvement maintained in 1887. |
| Fuller (Detroit). | Detroit Lancet, 1878, i. | ... | ... |
| Tillaux (Two cases). | Bull. Acad. de Med., 1880, ix. 401. | Extirpation of thyroid. | Great relief in one case; recovery in the other. |
| Ollier (Lyons). | Rev. Méd. de la Suisse Romande, 1883, p. 177. | ... | ... |
| Mikulicz (Cracow). | Centrlb. für Laryng., 1886, p. 184. | ... | All the symptoms subsided. It is not said how long the patient survived. |
| Sydney Jones. | Bristowe's Dis. of Nerv. Syst., p. 146. Ophth. Soc. Tr., vi. | Excision of isthmus. | Relief quite temporary; patient died in a few months from cardiac disease. |
| Lemke (Hamburg). | Deut. med. Woch., xvii., 1890, No. 2. Brit. Med. Journal Supp., 1891, i. (Abst.) | Half the gland removed in each case; in one case after previous tracheotomy. | Remaining half of goitre diminished, and the general symptoms abated. In both cases the health is said to have been good six months after. |
| Fraser. | Braithwaite's Retrosp., 1887, ii. p. 3. | Removal of whole gland. | ... |
| Rehn. | Berlin klin. Woch., 1884, xvi. 11. (Four cases.) | 1. Cyst laid open and drained. 2,3,4. Extirpation of whole thyroid. | Disappearance of the symptoms in all cases. |
| Dubreuil. | Gaz. de Paris, lviii. 1887. | Puncture of a cyst, which refilled, and was then enucleated. | Recovery with cure of symptoms; but digitalis and cold douches employed during treatment of wound. |
| Rupprecht. | Jahresb. d. Gesch. f. Natur u. Heilk. in Dresden, 1890, s. 63. | Removal of cyst. | Complete recovery. |
| Stelzner. | Deut. Zeit. f. Nerven Heilk., s. 435, 1891 (Abs.). (Two cases.) | 1. Extirpation of thyroid. 2. Resection of isthmus. | In both cases tetany ensued; no real improvement. |
| Sprengel. | Same reference as last. | Extirpation of thyroid for stenosis of trachea. | Stenosis relieved; palpitation diminished; exophthalmos remained unchanged. |

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Tracheotomy [1] for pressure on the trachea has proved exceedingly unsatisfactory. All the patients have died except Lemke's, who was only saved by the addition of immediate laryngotomy, and removal of half the thyroid a week afterwards.

Ligature of the thyroid arteries has been performed by Rydygicz of Cracow, and I believe also by Kocher.

The application of a seton through the thyroid was tried by Macnaughton Jones.[2]

Nerve stretching has been tried once in a case apparently complicated with paralysis agitans.[3]

The most startling results, however, have been produced by treatment directed to the *inferior turbinated bones.*

Hack (of Freiburg) removed part of the inferior turbinated bones, which were the seat of chronic thickening, in a girl of 16, in whom exophthalmos had existed since childhood, and palpitation and goitre for many months. The operation was performed with the galvanocautery, and subsidence of all the symptoms followed.[4]

Fränkel [5] also reports the amelioration of symptoms which followed the application of the galvanocautery to the inferior turbinated bones. The application was made to the two sides at some weeks' interval, and the immediate effect on the goitre was limited to the side treated; after application was made to both sides, the thyroid enlargement disappeared, and the pulse regained its normal rate.

Bobone [6] makes a similar observation.[7]

Hopmann,[8] by treating chronic atrophy of the mucous membrane of the nose in a woman the subject of exophthalmic goitre, claims to have cured the palpitation and exophthalmos.

Since gaining this information, I have examined the nasal mucous membrane in five cases, but failed to find anything abnormal.

Mackenzie,[9] however, noted some years ago that patients often complain of a "stuffed up" feeling in the nose.

[1] Spencer, Trans. Path. Soc., 1891; Montgomerie, Lancet, Feb. 7, 1891; Deutsche med. Woch., p. 47, 1891.
[2] Brit. Med. Jour., ii. 775, 1874.
[3] Möbius, Memorabil. Heilb., iii., 1883.
[4] Deutsche med. Woch., xii. 25, 1886.
[5] Berlin. klin. Woch., xxv. 111, 1888.
[6] Annales d'Oculist., xcvi. 260, 1886.
[7] Mr. Spencer Watson reported another case (Medical Society Trans., vol. xv. p. 309). It is not apparent from his paper that this was one of Graves' disease, but he kindly informs me by letter that it probably was of that nature. In this case the inferior turbinate bones were freely removed.
[8] Berlin. klin. Woch., xxv. 42, 1888.
[9] Lancet, ii. 545 1890.

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# A CASE OF RAYNAUD'S DISEASE,

AND

## SOME POINTS IN ITS PATHOLOGY.

BY

A. HAIG, M.D.

Without going into great detail, it may be said that Raynaud in his Thesis published in 1862 attributed the local asphyxia and symmetrical gangrene of the extremities which he described to a spasmodic contraction of capillary vessels.

He acknowledged that this might be a general condition, affecting the vessels all over the body at the same time, but producing serious effects only in the extremities, because these are the portions of the body which have most surface in proportion to bulk, and therefore most quickly lose their heat by conduction and radiation, and most early become cooled down below the point at which the life of the tissues can be continued (Thesis, p. 166). He observed that at the time of an attack of asphyxia or gangrene of the extremities, the skin was everywhere cold and pale, and the case of which I shall presently give notes shows, I think, that the temperature of the body at a distance from the seat of attack falls at the time of an attack, and rises again as it passes off.

I shall also point out, as I have done in previous writings, that there is good reason to believe that the vessels of the kidney are contracted at the same time with those of the skin, and Raynaud himself mentions the signs of this without understanding their import; and there is also some reason to believe that the vessels in the brain, lungs, and other viscera are in a similar condition,

Raynaud himself, however, gives no good or satisfactory reason why the arterioles and capillaries should be affected by this spasmodic contraction: it is true, he remarks, that it is often met with in nervous people, and those who suffer from

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hysteria, epilepsy, &c.; but what influence he attributes to the nervous system in producing these phenomena all over the body is not very clear.

At this point I think that my researches come in, and I have suggested that the vessels are contracted owing to the presence of uric acid in the circulation (*British Medical Journal*, February 1889, p. 291).

I have not attempted to explain the way in which uric acid acts on the vessels, but have devoted myself entirely to making as certain as possible of the fact, about which I have now no doubt.

I have, however, pointed out that the action of uric acid in this matter resembles that of digitalis and other drugs, which are well known to contract the peripheral vessels, though no one has, I think, as yet told us the way in which they produce this result. It seems, however, that they must act locally, as they will contract the vessels of a limb or organ that has been severed from the body (see Dr. Lauder Brunton, "Pharmacology and Therapeutics, 3rd edit., p. 318).

I shall now give the notes of the case which forms the subject of this paper, and shall compare it with two other cases which have previously been under my care ("Uric Acid,"[1] p. 218, and Transactions of the Medical Society, vol. xv.), and also with Raynaud's cases, and shall discuss especially the points which seem to me to render it probable that the contraction of the vessels is produced by uric acid.

Hannah E., æt. 47, admitted into the Metropolitan Hospital, 7th April 1892.

Had one child, which died at age of five months, of "pulmonary consumption."

Has two sisters, who are well.

Had five brothers, but one is dead, and one dying of consumption; three are well.

Father died of apoplexy.

Mother, aged 66, is well.

Patient had rheumatic fever twelve years ago; phlebitis of right leg ten years ago; inflammation of lungs eight years ago; bronchitis twice since that.

Fingers have been painful and blue, with tendency to ulceration on and off for three years.

The right hand was first affected, and the left became affected in December 1891, when she was ill with bronchitis.

[1] "Uric Acid as a Factor in the Causation of Disease." J. & A. Churchill, 1892.

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The first symptom was pallor or blueness of one or more fingers, especially after washing the hands in cold water. Later on, blebs formed on the fingers and burst.

Fingers are growing shorter and more stumpy, and are getting more painful.

Has general shivering when the attacks of coldness come on in the fingers.

A pale, poorly-nourished woman.

Temperature generally subnormal; pulse 80, irregular in force.

*Heart.*—Apex-beat in fifth space, just outside the left nipple-line. Blowing systolic murmur at the apex. Other sounds, nothing remarkable.

*Lungs.*—A few mucous râles both sides; no dulness.

*Abdomen.*—Nothing abnormal. Bowels tend to be constipated.

*Urine.*—Specific gravity, 1012; contains a trace of albumen. Thinks she has been passing more water of late.

*Legs* show dilated venous capillaries.

*Right hand.*—All fingers somewhat blue and shining, but the first and middle finger have a red tinge, and are somewhat clubbed, while the ring and little finger are tapering, and somewhat colder than the others.

Nails on the first and middle finger are short and have transverse striæ, the others have longitudinal striæ.

All fingers are marked with scars, which have dried up, and all are more or less painful.

*Left hand.*—All fingers are blue and shine, and taper from the first interphalangeal joint to the tip. All are abnormally cold and rather tender.

On the index finger there is an excoriation just in front of the nail, where a slough has separated.

The middle finger has a suppurating point under the nail, and on the last phalanx there is a bleb the size of a filbert, containing dark fluid and a slough, very painful.

The ring and little finger are tapering and cold.

All nails are curved and longitudinally striated.

Sensation is fairly perfect in all fingers.

The urine was examined on several occasions, and it always contained a trace of albumen, and had a low specific gravity.

I came to the conclusion that we were dealing with chronic Bright's disease and chronic bronchitis, dilatation and hypertrophy of the left ventricle, with or without some lesion (rheumatic) of the mitral valve, with, at the present time, some failure of compensation, shown by the irregular force of the systoles, and

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the somewhat rapid rate of action; and that with these conditions it was not very extraordinary that we should find what we may call chronic Raynaud's disease, with exacerbations affecting the hands.

April 7.—I put the patient on nitro-hydrochloric acid and nux vomica three times a day before meals, and salicylate of soda three times a day after meals, and ordered that a tablet of nitro-glycerine P.B. should be given from time to time when the fingers were more than usually painful.

April 12.—Still has attacks of pain in the fingers, which turn white and blue, and get very cold. The pain in them wakes her up. Takes the nitro-glycerine tabloids, and is sure they do good; feels warmth and comfort returning to fingers about three-quarters of an hour after one.

April 13.—Pains are relieved by the nitro-glycerine. Temperature to be taken before and after a tabloid.

April 14.—Complains of coldness of left foot, the great, second, and third toes being painful and rather blue.

April 16.—Temperature in axilla .6° up after a tabloid had relieved the pains. Observation to be repeated.

April 19.—Better; no attacks at all. No tabloids taken; fingers are less cold.

April 20.—Had an attack with a headache at 7.30 A.M. to-day. A tabloid was given at 8 A.M., and a second soon after. Got quickly better after the second tabloid. Temperature in the axilla at the time of the attack was 97.2°; when the tabloids had relieved the fingers it was 97.8°, and it rose to 98.2° in the evening.

April 27.—No attacks for several days; the slough on second finger of left hand has separated and the ulcer is healing.

May 3.—Has a headache to-day, and the fingers are colder; they were fairly warm yesterday.

May 4.—Above mixture left off, and phosphate of soda 3ss. given three times a day in their place.

May 7.—Has an occasional headache, but the fingers are only slightly affected; no severe attacks of late.

May 9.—Had a bad headache at 11 A.M. to-day.

May 11.—Fingers very blue and cold to-day in spite of the warm weather.

May 14.—Fingers are much less blue to-day.

May 17.—Had a bad headache at 2 A.M., and the fingers are worse to-day. The index finger of the right hand is getting swollen and painful in the last phalanx. After this she soon got better, and went out.

The temperature was generally subnormal, the highest being

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99.2° on the evenings of 20th and 27th April, and the lowest 96.6° on the morning of the 8th April.

Of Raynaud's twenty-five cases, twenty were women; they were for the most part young, only one being (48) older than this patient.

One of his cases, No. xviii., had mitral disease (constriction). This patient was worse in the spring of the year, and Raynaud mentions the autumn and spring as being the common seasons of onset.

The case also fulfils Raynaud's definition in that the troubles were to a large extent symmetrical; and like it, also, several of his cases became chronic, lasting for years, with periods of intermission—a condition of things which he thinks is specially seen among the slighter forms of the trouble.

The two cases previously under my care were little girls, aged 3 and 5 years respectively, and their attacks (though lasting on and off for several months in one case, Eliza H.) were more acute than in this patient.

In the cases of these children, I examined the urine, and found an excessive excretion of uric acid, corresponding to the attacks, and, as far as one could judge, the excess of uric acid seemed to be roughly proportional to their severity.

In the patient whose case I have just narrated above, I did not estimate the uric acid for two reasons: 1st, because, as I have said, her attacks were not very well marked, so that it would have been difficult to separate the urine corresponding to them; and 2nd, because I came to the conclusion that she had Bright's disease, and there seems to be reason to believe (see "Uric Acid," pp. 44, 225, and 253) that Bright's disease, especially in its acute stages, interferes with the elimination of uric acid, so that there may be an excess of uric acid in the blood without any corresponding excess in the urine.

Eliza H. had hæmoglobinuria with some of her attacks, and I have given ("Uric Acid," pp. 212–215) the amounts of uric acid I found in the urine in other cases of hæmoglobinuria. This patient also had pallor of skin, headache, and bad temper at the time of her attacks; and when she was put on drugs similar to those I gave to Hannah E., all her symptoms greatly diminished in severity or disappeared.

In the case of Hannah E. the family history is of some interest, for her father died of apoplexy, for which we may not be far wrong in reading chronic high arterial tension, Bright's disease, and cerebral hæmorrhage; then two brothers had phthisis, and there is almost certainly important connec-



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tion between gout and phthisis, and one of the links of this connection stands out, I think, pretty clearly in the fact that the substances (uric acid, &c.) which contract the arterioles and capillaries of the general circulation contract also those of the lungs and diminish the output of water from them (see my paper on dropsy in the *Lancet*, July 1892, especially my remarks on the researches of Dr. Yavein).

She herself had rheumatic fever, which, as I have endeavoured to show ("Uric Acid," chap. ix.), is due to uric acid, and two years later phlebitis in the leg, the relationship of which to gout is well known.

Then the troubles for which she was admitted became worse in the spring, and I have shown that in spring and summer there is a plus excretion of uric acid in the urine, the sign that an excess of it is passing through the circulation on its way to the kidney, while in the winter there is a diminished excretion with some storage of urate in the organs and tissues, the plus excretion of the warm season being the result of, and to some extent proportional to, the minus excretion of the cold (see "Uric Acid," pp. 14, 131).

Then her attacks were often in the morning—in fact, just at the hours when in the normal physiological cycle the excretion of urate and the amount passing through the blood is greatest, and we have all the signs of its excess in the blood in the cold and pale surface, and the headaches which so frequently accompanied the attacks, and much the same may be said of the majority of the attacks in the case of Eliza H.

There are a few points also which I should like to draw attention to in Dr. Southey's very interesting case of symmetrical gangrene, which I was fortunate enough to see, and which is recorded in the "Transactions of the Pathological Society," 1883, p. 286.

The patient was a girl under three years of age. It is recorded that her face and the rest of her skin presented an ashen pallor—"axilla temperature 99.4°, pulse 120, small, and a little wiry at the wrist." She was evidently passing into the stage of reaction with rise of temperature. Her urine was alkaline, deposited urates and phosphates, and contained albumen. There could, I think, be no doubt that this alkaline urine contained an excess of uric acid relative to urea, and that the albumen was probably due to blood changes similar to those that produced the hæmoglobinuria in one of my cases (Eliza H.).

At the post-mortem, which is interesting as adding one more to the rather scanty records of such observations (Raynaud records only three), nothing abnormal was found in the vessels

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of the asphyxiated parts, but the blood was everywhere fluid and "like black cherry juice."

In the discoloured parts the skin and connective tissue were chiefly affected, the muscles were only a little stained, and there was no effusion into the joints; and this is interesting, as Raynaud remarks that the lesions are more superficial than one might at first sight expect.

From the parents it was made out that there was undoubted syphilis in the father's family, and he had suffered from hæmatemesis.

The child had an attack of "febrile purpura" in October, and a feverish attack for three days from the 13th to the 16th November.

Her last illness began on the evening of 1st December with headache. Next morning she was apparently well, but at 4.30 P.M. complained of her legs, and her father seeing bruises on them, rubbed them, which appeared to make the pain much worse, and from that time the trouble increased up to her death.

I think it quite possible that the final attack was a post-febrile rebound coming after and due to the fever of the 13th to 16th November, similar to the post-febrile conditions we see every day after pneumonia, typhoid, scarlet, and other fevers, with its symptoms of slow, high-tension pulse (post-febrile bradycardia), sub-normal temperature, and general depression, and which are due, as I have shown, to the urate which is stored during the fever passing through the blood, when, with falling temperature and falling acidity, the conditions become favourable to its solution and excretion; in a word, there is post-febrile uric acidæmia and its symptoms, and Raynaud's disease is, I believe, a mere exaggeration of some of these.

In the case of my patient Margaret C., the attack bore precisely the same relation to a previous fever, probably scarlet fever.

It may be objected that in Dr. Southey's patient the interval from the 16th November to the 1st December was too long to allow of this explanation, but I think it is very probable that the fever did not really come to an end quite as soon as the parents made out, and the way in which serious diseases are allowed to pass almost unnoticed among the children of the poor is familiar to us all. The first sign of this post-febrile uric acidæmia was the headache of December 1; possibly this was followed by a little febrile movement which temporarily raised the acidity and made her appear bright and well next

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morning, but by the afternoon this had come to an end, and at 4.30 P.M., which comes in what I have spoken of as the afternoon alkaline tide, the full force of the uric acid storm, no doubt reinforced by the temporary fluctuation of the previous night, affected her vessels, and the gangrene began.

A glance at the plate which accompanies the description of Dr. Southey's case shows that the asphyxia affected first and chiefly those parts of the legs which in children of this age are commonly left without covering, and so are exposed to great loss of heat by radiation and conduction; so that Raynaud's argument (given above) with regard to the hands and feet will hold also for this case, for it was the skin, and not the deeper tissues that were affected. The most interesting part of Raynaud's thesis is that in which he discusses the etiology of the trouble, and sums up the arguments for and against each theory.

He devotes a good deal of attention to arteritis, but sums up against it on the grounds that there is no anatomical proof of its presence, and that permanent changes in the vessels will not account for alterations in circulation which are paroxysmal and temporary.

Much the same conclusion is arrived at with regard to the nervous system, though he is himself more in favour of this explanation; but he points out that though a lesion of nerve structure undoubtedly influences the nutrition and sensation of the parts supplied by the injured nerve, the effect is local, and does not affect especially the circulation, while the condition he is describing affects primarily the circulation, the altered nutrition being secondary to this, and it is not entirely local, as the whole surface of the body is affected to some extent in the same way; and he finally concludes that spasmodic contraction of capillary vessels gives the best explanation, for the following reasons. The circulation in the arteries is little if at all affected in the paroxysms; the large veins are also free, and obstruction of a vein gives rise to totally different conditions from those met with in the cases he is describing. The chief point in local asphyxia is the extreme slowness with which the venous capillaries refill when emptied by pressure. In an asphyxiated finger, if the capillaries be emptied by pressure, as much as thirty seconds may elapse before they regain their colour; in a normal finger the blood will return in one or two seconds. If a ligature is passed round a finger so as to obstruct the veins, it becomes purple and congested, it is true; but if a pale spot is produced by pressure, the blood returns into its vessels even more quickly than in the normal condition. It is evident, therefore, that the obstruction is neither in the arteries

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nor in the veins, but in the small vessels that lie between them, and the obstruction is spasmodic, because, as in the well-known phenomena of "dead finger," it may pass away and leave no effect behind it. If, on the other hand, the spasm persists for some time, nutritional changes, which, however, are entirely secondary, will ensue.

Such being the etiology of the local asphyxia, let us glance at its relationship to other diseases as depicted by Raynaud.

Thus he mentions (p. 72) a case in which the blood was examined, and showed diminution of red cells and increase of white cells, and remarks that this led M. Simon to class the case under the head of leucocythæmia.

Raynaud, however, questions whether leucocythæmia is a disease at all (p. 74), but suggests rather that it is but one symptom of a blood change which has as its results, on the one hand, local asphyxia, and on the other diminution of red cells, increase of white cells, and hypertrophy of the spleen and glands.

I may say at once that this is a view which recommends itself very strongly to my mind, and indeed I had already (*Lancet*, March 1892, p. 663, and elsewhere) given a similar explanation of the facts before I was aware of this passage in Raynaud's thesis. And I have pointed out that in my case (Eliza H., see "Transactions of the Medical Society," prev. ref.) an examination of the blood during some of her attacks, accompanied by hæmoglobinuria, which was made by my colleague Dr. S. W. Wheaton, showed increase of white cells, diminution of red cells, and increase of coagulability; and I have given my reasons for believing that these blood changes are the results of the presence of an excess of uric acid in the circulation. (See "Uric Acid," p. 212 *et seq.*)

It has been suggested by Dr. Hunter that the excess of uric acid which I found in the urine in these cases was the result of the blood changes, and not the cause of them; but I have given (*Lancet*, prev. ref., and "Uric Acid," p. 212) my reasons for not sharing this opinion.

The enlargement of the spleen mentioned by Raynaud is interesting (and it was also present in Dr. Southey's case), because I have found ("Uric Acid," p. 46) that in nearly all conditions where the spleen is enlarged (and indeed, as I have pointed out, many others have observed the same thing), there is an excess of uric acid in the urine and in the blood (see "Uric Acid," p. 46), and I have been led to infer that this excess of uric acid was the result of the conditions which produced the

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enlargement of the spleen, namely, malarial and other fevers, of which I shall have to speak presently; so that the enlarged spleen and excess of urates in the blood and urine may be mere modifications of that most common condition, post-febrile uric acidæmia, which, again, is not uncommonly a cause of Raynaud's disease or allied conditions; so that the observed connection between this disease and leucocythæmia is completely explained.

The relationship of Raynaud's disease to menstruation and pregnancy is of considerable interest, though Raynaud only narrates one case in which the symptoms underwent a monthly exacerbation, and even here we are not told, as he remarks, whether the attack coincided with the period. I should myself, however, have very little doubt that this was the case, for I know of no physiological condition in which an excess of uric acid in the urine and the blood is more certain to be met with than in menstruation.

As a matter of every-day observation, all conditions which upset nutrition and interfere with the taking and absorption of food at once produce a fall in the acidity of the urine and an increased excretion of uric acid and menstruation, even when normal, and much more so dysmenorrhœa almost invariably brings about these results; and we get as a consequence of the uric acidæmia so produced the mental depression, headache, fits, and other troubles from which women are so well known to suffer at these times. The same fact explains also why women so rarely suffer from gout till after the menopause, because this monthly plus excretion of urates prevents their stores and accumulations of the substance from becoming so large as they do in the case of men.

Raynaud, however, mentions a very good instance of the opposite effects of pregnancy; for just as menstruation lowers nutrition and increases the excretion of urates, so does pregnancy act as a stimulus to nutrition; up goes urea and acidity, and the excretion of urates is diminished—that is, excretion falls below formation, and urates are held back and retained in the body, and with this the blood is cleared of urates and the circulation goes on freely. Now Raynaud tells us (p. 48) of a woman who noticed that the complete disappearance of her symptoms was the first indication of commencing pregnancy.

He says that in this case menstruation had no effect on the trouble. Possibly this woman had but very slight menstrual troubles, but the common effects of menstruation on the cerebral circulation are met with every day, and are too obvious to be passed over.

Here again we can explain a whole series of phenomena; for

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if pregnancy thus causes a retention of urates in the body, just as do most fevers and a large number of drugs, such as mercury, opium, and others, about which I have written at length,[1] when the pregnancy comes to an end, and urea and acidity fall owing to the interruption of nutrition which parturition occasions, there will be an excessive excretion of urates, the result of the previous retention, and we get what I have spoken of in the case of drugs as a rebound, not post-morphinal or post-febrile uric acidæmia, but post-puerperal uric acidæmia. The cause is in each case the same; the result is also the same. We get contracted arterioles, and the result of this, slow high-tension pulse, which may be irregular or intermittent; cold skin and extremities; scanty, it may be, albuminous urine; headache; mental depression, and even fits; and Raynaud (p. 130) mentions two cases of the disease as coming on after recent delivery.

See also the most interesting parallel which is here presented to us between migraine (the uric acid headache) and Raynaud's disease; for we read in Dr. Liveing's most valuable work (Megrim and Sick Headache, pp. 46–47) of a woman who inherited the complaint from her father, and "became subject after puberty to severe attacks of megrim, recurring at the monthly period, generally immediately after menstruation. She married at twenty and had a large family, and it is remarkable that throughout her pregnancies she has been perfectly free from the complaint, which has invariably returned after delivery."

It will be evident that we can explain completely every fact here mentioned. Both troubles are due to uric acidæmia, and the effect of menstruation and pregnancy on this is in every case the same. But in the one patient the uric acidæmia and the high tension it produced affected especially the intracranial circulation and caused headache. In the other, the contracted arterioles affected especially the extremities, and produced Raynaud's disease.

No doubt a series of anatomical and physiological, or even pathological, conditions determined in each case the locality to be most affected; but these are of little consequence, because, as I have shown, and can demonstrate at pleasure, if the blood is kept moderately clear of urates, neither kind of disturbance would take place or continue.

With regard to irregular pulse, Raynaud mentions several cases in which this was observed, and he regards it as a purely nervous phenomenon. I have pointed out, however, that my pulse never falters or flutters except when I am suffering from contracted arterioles and high tension, and also that this and

[1] "Uric Acid," pp. 36 and 32.

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other "nervous" phenomena do not appear when my blood is kept free from any great excess of uric acid.

As to fevers, Raynaud mentions (p. 55) the case of a woman who had some attacks of ague in March, and about the middle of April began to be very easily affected by cold, so that exposed portions of her body became pale and then slate-coloured.

In one of my cases the attack came after a fever, and in another it came in a period of extremely low nutrition, perhaps due to insufficient food; and I have suggested that Dr. Southey's case was also due to post-febrile uric acidæmia.

Now fever, as I have just pointed out in the case of pregnancy, increases metabolism; the excretion of urea and of acid rises, the alkalinity of the blood is diminished, and as a result it is cleared of urates, and the excretion of urates in the urine is diminished to a corresponding extent; but the blood being cleared of urates, the arterioles are free to relax, and we get a quick low-tension pulse, as is well known. The urates are, however, not merely kept out of the blood; they are also kept out of the urine—that is, are kept back and retained in the body—and when the acidity falls at the end of the fever, out they come again, flooding the blood with an excess of urate and producing post-febrile uric acidæmia, with all its signs and symptoms, prominent among which are slow high-tension pulse and scanty urine; so that the relaxed pulse of fever and the tense pulse which follows it are the simple results of the altered metabolism through its effects on the quantity of urates in the blood. (See "Uric Acid," p. 118.)

As I have said, Raynaud mentions what I regard as most undoubted and independent signs of dilated and contracted arterioles without having himself understood their import, for on p. 99, in describing an attack, he tells us that the urine is small in quantity, and on p. 121 he says, "Quelquefois chaque accès se termine par une abondante emission d'urines."

Can anything be more simple than the explanation of this? Could anything prove more completely that contraction of arterioles is present at the time of the attack, and is subsequently removed?

I have pointed out that under all conditions, both in physiology and pathology, the excretion of water in the urine is from hour to hour and day to day inversely as the uric acid; and that as the urate excretion can be controlled by drugs, the excretion of water can also be controlled.

I have also pointed out that it has been shown that digitalis, which is well known to contract the arterioles and capillaries, does by this contraction reduce, or even completely arrest, the

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flow of urine, and have suggested that a similar contraction of the arterioles of the kidneys by uric acid accounts for the inverse relation between water and uric acid in their excretion.

In Raynaud's disease, therefore, we have evidence not only that the arterioles and capillaries are contracted in the affected part and over the surface generally, but we also know and have evidence that they are contracted in the kidneys in the fact recorded by Raynaud that the urine is scanty; and in the fact that the attacks may come to an end with a diuresis we have evidence that the vessels are dilated not only in the affected area and the skin generally, but also in the kidneys.

I would also point out the interesting parallel which these facts bring out between the attack of asphyxia on the one hand, and uric acid headache, epilepsy, and hysteria on the other. In all of these, the attack is contemporaneous with a scanty secretion of urine, and is followed by more or less diuresis; and in all the results are due to the same cause: the improved intracranial circulation which removes the neurosis is contemporaneous with an improved circulation in the kidneys which allows of a diuresis.

But if Raynaud had investigated any of the other secretions, they would have told him the same story, for the saliva is scanty at the same time, and for the same reason, that the urine is scanty; and I see good reason to think that the gastric juice, the bile, and the other secretions are similarly affected. Nor are we without similar evidence in respect of other organs, for in all my three cases, and to some extent also in Dr. Southey's, the headache, mental depression, and bad temper which accompanied the attacks, gave plenty of signs that the intracranial circulation was far from satisfactory; and in my case Eliza H., when drugs appeared to prevent her attacks, one of the most marked concomitant signs was a very decided improvement in temper.

The fact is that in uric acidæmia the vessels all over the body are contracted, and all the most important organs and tissues give evidence that their functions are thereby disturbed; and the relation between Raynaud's disease and certain neuroses, such as hysteria, epilepsy, and the headache and mental depression of which I have spoken, amounts simply to this, that they are all effects of uric acidæmia, and for this reason often occur together; and these disturbances, which seemed to Raynaud to show that the nervous system had some hand in the causation of symmetrical gangrene, merely prove that the disturbance of circulation which produces the gangrene in the extremities produces also such changes in the intracranial

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circulation that certain contemporaneous changes in the functions of the great nerve centres result.

What these changes will be depends in any given case on a variety of other general and local conditions, in addition to the uric acidæmia which is common to all, and will vary according as the local conditions tend to favour or counteract the effects of the uric acidæmia on the local circulation.

I quite believe that there are people "whose heads have never ached," but it would not at all follow that they had never had uric acidæmia, but rather that the conditions of their intracranial circulation were such that high arterial tension disturbed them but little; in others, again, the local conditions might favour circulatory disturbance by high tension, and these would suffer with headache even in slight uric acidæmia; and the local conditions giving rise to these differences of effect may be anatomical, physiological, or pathological.

Syphilis is mentioned by Raynaud as an antecedent in two cases, and there was a history of congenital syphilis in the father of Dr. Southey's patient; and this, it seems to me, is just one of those things which may so alter local conditions as to render parts previously enjoying immunity liable to the worst effects of uric acidæmia and the high tension which it produces.

Thus syphilis may produce such changes in bone membranes or intracranial contents as will make all the difference between uric acidæmia and high tension seriously affecting the intracranial circulation and hardly affecting it at all; and, similarly, in the extremities syphilis may produce such changes in the vessels as may make the difference between mere cold hands or "dead finger" and a regular attack of Raynaud's disease, the uric acidæmia being the same in both cases.

It will be evident, then, that in claiming Raynaud's disease as an incident in uric acidæmia, I by no means seek to exclude other factors which may both intensify the action of the uric acidæmia and determine the locality which shall suffer most.

Indeed, I think it is very probable that the preponderance of girls and women among the sufferers from Raynaud's disease is due to their having less muscular power and activity than males of the same age; for there can hardly be any doubt that any weakness of the left ventricle would greatly increase the evil effects of contracted vessels on the nutrition of the extremities.

Opium was the drug of which Raynaud made most use in treatment, and he raises the question of its action on the muscular fibres of the arterial coats, the relaxation of which is his chief object. He mentions Pott's unbounded confidence in it

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for the cure of gangrene, but seems to think it is of use chiefly as a narcotic.

I have been able to show that in conditions of uric acidæmia and high tension, opium relaxes the arterioles and produces diuresis by raising the acidity and clearing the blood of uric acid; and this action of opium causing storage and retention of urates in the body is followed, just as in the parallel cases of fever, pregnancy, and the seasonal variations in excretion mentioned above, by a rebound; and we have, as the action of opium comes to an end and the acidity falls, not a post-puerperal or a post-febrile uric acidæmia, but a post-morphinal uric acidæmia; and I have been able to show, with regard to this latter, that if the urate is removed by a few timely doses of a salicylate, the post-morphinal uric acidæmia, with all its signs and symptoms (slow high-tension pulse, scanty urine, headache, and mental depression), fails to appear. Exactly the same thing applies to post-plumbic and post-mercurial uric acidæmia. (See "Uric Acid," pp. 28 and 147.)

I believe, also, that to a very considerable extent post-febrile uric acidæmia with its results might be prevented by a similar use of salicylates during the fever.

But some one may say, After all, what proof have you that uric acid does produce the effect on the arterioles which you claim for it? Your clinical experiences are very interesting and suggestive, but they hardly amount to proof, and, so far as is known, the injection of urates into the vessels of animals produces little or no effect.

I am quite ready to acknowledge that injection experiments in animals have not as yet given positive results; but with regard to this I would make two remarks: first, that the difficulty in obtaining urates in solution places great impediments in the way of their satisfactory injection into small animals; and, second, that the injection of a certain amount of urate in solution into the blood of an animal is a totally different thing from getting the blood of that animal into a condition to hold that urate in solution.

In man it is possible, as I have shown, to increase or diminish at pleasure the uric acid in the urine, but it is not possible to diminish its excretion except by the use of drugs which either form insoluble compounds with it or diminish the power of the blood to hold it in solution; nor, on the other hand, is it possible to increase its excretion except by giving drugs, which form soluble compounds with it or increase the power of the blood to hold it in solution. Indeed, I believe you might inject urates into the blood of man, and, unless that blood had been pre-

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viously prepared to hold the urates in solution, you might produce little or no effect on the contraction or dilatation of his arterioles. For instance, any one of the drugs which diminish the excretion of urate in the urine produce at the time of their administration, especially when there is much urate in the blood, more or less marked pricking and shooting pains in the joints and fibrous tissues exactly similar to those described by Sir A. Garrod as due to urate irritation. If at this time a solution of urate is injected into the blood stream, it will probably follow the urate that was previously there into the fibrous tissues, the liver, spleen, and other organs; and though it may increase the pains in the joints, it will not contract the arterioles and capillaries to any appreciable extent.

And as a very large number of drugs have one or other effect, and as the dilatation or contraction of arterioles corresponds in each case with the uric acid, and not with the drug, and as all the phenomena which result from dilated or contracted arterioles vary absolutely with the excretion of uric acid, and not with the dose of the drug, so that a drug will produce one effect when there is much uric acid, and no effect at all when all the uric acid has been previously removed (see remarks on opium above), I have inferred, I think not unreasonably, that the contraction or dilatation of arterioles depends on the amount of urate in the circulation, and is influenced by all drugs which influence this, but only indirectly.

Why, if contraction or dilatation of arterioles depends on anything except uric acid, why is it that, other things being equal, the excretion of urinary water in every one is, as I have shown ("Journal of Physiology," vol. xiii.; *Lancet*, July 1892), from day to day and hour to hour inversely as the excretion of uric acid? Why is it that the excretion of water is least in the alkaline tide, when the excretion of urates is greatest, and most in the acid tide at night, when the excretion of urates is least? Why is it that when you increase the excretion of urate with this, that, or the other drug, the urinary water diminishes, and why when you diminish the excretion of urate, which can be done with any one of eight or ten different drugs, does the urinary water increase? Each of these ten or more drugs diminishes the excretion of urates in the urine, and if it is given at a time when the excretion is large, as during a uric acid headache, its effects will be most marked.

The slow high-tension pulse will be replaced by a soft and quick one, the cold skin and extremities will become warm, the dry mouth will become moist and the scanty urine profuse; and the mental changes will be no less marked—the headache will

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vanish, and mental and bodily depression will be replaced by feelings of strength and well-being; and, as if to prevent our being in any doubt where the urates have gone to, there are pricking and shooting pains in the joints and other fibrous tissues.

Exactly the same effects on the pulse and general circulation can be produced by simply clearing the blood of urates and leaving it clear.

Thus take on one day 60 gr. of salicylate of soda in four doses (last dose at 7 P.M. if twenty-four hours end at 7 A.M. next day), and the next day no drugs at all. If you watch the excretion of urates, you will see that on the salicylate day the uric acid exceeded its relation to urea of 1–33 by some four or five grains (relation 1–16 or 1–20), and with this the urine will be scanty. On the day after the salicylate the uric acid will fall very much, and will have a relation to urea between 1–30 and 1–40, and now the urine will be profuse and the arterioles everywhere relaxed, producing all the mental and bodily conditions of well-being.

Mere absence of urates from the blood produces these effects without any drug at all; for if they were directly due to the salicylate, they should have been more marked on the day it was taken, when there was most of it in the blood and urine; but the arterioles were contracted on this day, and the urine was scanty.

The same effect is produced by any drug which forms an insoluble compound with uric acid and clears it out of the blood (as acids, opium, mercury, lead, zinc, copper, and many others); but here the effect is immediate, and follows a few minutes even after the drug has been swallowed, and we know in this case where the insoluble urates go to by the pains in joints and fibrous tissues above mentioned.

In the case of the salicylate well-being, the urate has been cleared out of the body and eliminated; but the effect in both cases is the same, and is due to the one factor that is common to both—the absence of urates from the blood.

These effects are by no means peculiar to acids, opium, and mercury, about which I happen to have written at greater length, and, as in the case of acids, opium, and mercury, the action of all is followed by a rebound, which again can be prevented if the urates are removed by means of salicylates.

But if any further proof is needed, the action of the salts of lithia is alone, I think, sufficient to demonstrate my point. Give several doses of the alkaline salts of soda or potash, and observe the hourly excretion of urine and the arterial tension;

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we get contracted arterioles, high tension, and scanty urine. (See "Uric Acid," p. 107.) Let us say, for the sake of argument, that this effect is due to the increased alkalescence of the blood and diminished acidity of the urine.

Now, give a few doses of a salt of lithia. What do we get? Dilated arterioles, lowered tension, and profuse urine. But lithia salts diminish the acidity of the urine; they ought therefore to act like potash and soda, but unfortunately they do not. On uric acid, however, the effect is very different; soda and potash increase its excretion, while lithia diminishes it. (For the full explanation of this see "Uric Acid," p. 105.) And these numerous drugs have absolutely no property in common, save only their action on the solubility and excretion of urates, and their effect on the arterioles coincides absolutely with this, and with nothing else.

Now, I ask any unbiassed person to look at all these facts, and to show, if he can, that they are not facts, or, failing that, to say whether any other explanation of them is possible except that I have given, namely, that urates contract the arterioles and capillaries all over the body?

In the above paper I have endeavoured to show that this explanation enables us to account for many of the most important points in the causation of Raynaud's disease.

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# TWO CASES OF CHOLECYSTOTOMY:

## REMOVAL OF A HUNDRED AND THIRTY AND OF SIXTY-FOUR CALCULI.

BY

JAMES BERRY.

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The two following cases, which have recently been under my care, seem to me to be worthy of publication. They are in many respects very dissimilar. Although neither of them can be said to be particularly rare, yet each presents features of some interest.

CASE I.—*Great Distension of the Gall Bladder with Clear Fluid and Calculi—Cholecystotomy—Complete Recovery.*

Margaret Q., æt. 58, lady's-maid, married, was admitted into the Royal Free Hospital under my care on November 14, 1891, suffering from an "abdominal tumour."

*Previous history.*—Until the beginning of the present illness the patient had always enjoyed fairly good health. She had two attacks of "pleurisy" many years ago, but does not remember on which side. She has suffered severely at times from facial neuralgia, and has had occasional slight attacks of rheumatism.

At intervals during the last twenty-seven years she has suffered from attacks of pain in the epigastrium. These usually lasted about a week, and were attributed by herself to indigestion. During these the abdomen was often swollen and tender, and retching was a frequent symptom. The pain does not appear to have been very severe. She has never been jaundiced, nor has she ever suffered from anything like severe hepatic colic; she has never to her knowledge passed gall-stones. On one occasion she passed a small quantity of "sand" with her urine. No history of renal colic. About five years ago she

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first became aware of the presence of a lump, about as large as a hen's egg, in the right side of the abdomen. At first it was not painful, and did not cause her any trouble, but it has grown steadily in size, and has lately caused much dragging pain at the upper part of the abdomen, and prevented her from walking with any comfort.

*Family history.*—Her mother died of stricture of the œsophagus. There is no family history of any hepatic disorder.

She has had four children, who are quite healthy; also four miscarriages.

*Condition on admission.*—A fairly healthy-looking woman, slightly anæmic, not jaundiced. Pulse 52. Temperature normal. Urine, acid, sp. gr. 1012; no albumen or sugar.

Thorax, nothing abnormal detected.

Abdomen slightly prominent; nothing abnormal to be seen. On deep palpation, there is found in the right side and upper part of the abdomen an oval tumour, measuring roughly 5½ inches vertically and 3 inches transversely. Below it extends one inch below the level of the umbilicus; internally it reaches nearly to the umbilicus; externally its border is deeply seated in the right lumbar region, in a vertical line with the anterior superior iliac spine. At the upper and outer part fingers can be pressed deeply between the tumour and the costal margin. The edges are fairly well defined everywhere, except at the upper and inner part. It is fairly movable transversely, especially at its lower part; it moves slightly with respiration. It is smooth and somewhat elastic. No pain is caused by palpation, except when the tumour is pushed over to the left; some dragging pain is then complained of. There is considerable tenderness in the epigastrium.

On deep palpation in the right lumbar region, a second rounded tumour, apparently about as large as a hen's egg, can be felt lying behind, and somewhat below and outside the first. Bimanually, with one hand behind below the last rib and the other on the front of the abdomen, the tumour, or two tumours together, can easily be grasped, and moved about to a limited extent transversely and antero-posteriorly. The tumour thus grasped cannot be definitely drawn away from the hepatic region.

The liver cannot be felt; no enlargement is detected by percussion. Spleen not palpable.

Nothing abnormal can be felt in any other part of the abdomen or in the pelvis.

There is no œdema of the lower extremities.

November 22.—The patient's temperature rose yesterday to

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101.6°; she complained of headache; the urine has been found to contain crystals of oxalate of lime.

November 23.—Temperature normal again.

November 27.—The quantity of urine passed daily varies between 29 and 36 oz. Sp. gr. varies from 1012 to 1020. The colon has been inflated with air to ascertain its relation to the tumour; the latter was found to lie to the inner side of the ascending colon.

November 27.—Since admission the tumour has not undergone any change.

The patient complains much of the dragging pain at the epigastrium, and is very anxious that something should be done to relieve her; she states her willingness to undergo considerable risk, if necessary, in order to get rid of the tumour. Under these circumstances, after consultation with several of my colleagues who were kind enough to see the case with me, the following operation was performed.

November 28.—*Operation.*—The skin having previously been rendered thoroughly aseptic in the usual manner, a vertical incision four inches long was made along the outer edge of the right rectus muscle, commencing at the costal arch; this incision was subsequently prolonged downwards and inwards for two inches, a small portion of the rectus muscle being divided. The abdominal wall was quickly cut through, all bleeding points secured, and the peritoneum then opened. The tumour at once presented itself in the wound, and was soon seen to be a very greatly distended gall-bladder. The liver was seen and felt at the upper part of the wound. The tumour was of a greyish-purple colour, translucent, very tense, and with exceedingly thin walls. It looked and felt very like a child's air-balloon. The tension and thinness of the walls were so great that the utmost care was required in manipulating the tumour in order to prevent rupture. A few adhesions passing from the gall-bladder to the colon were tied and divided. The tumour was then allowed to partially protrude through the wound, while the cystic duct was examined with one finger. A hard mass, evidently a gall-stone, was easily felt in this situation. Several warm sponges were then packed round the gall-bladder, some inside the peritoneal cavity, and some outside; and the fluid contents, to the amount of seven ounces, were then drawn off by an aspirator. The wound thus made in the gall-bladder was then enlarged, and a large number of calculi were removed. The stone in the cystic duct was then pushed back into the gall-bladder by means of a finger placed outside; it proved to be about as large as a marble. The gall-bladder was then



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washed out with boracic lotion, a small portion of it was cut away, and the remainder stitched to the skin by silk sutures. A large drainage-tube was inserted in the gall-bladder, and the remainder of the abdominal wound closed by deep sutures. A considerable quantity of normal bile flowed out through the tube. The wound was then dressed antiseptically with salalembreth gauze and wool. The second tumour behind the gall-bladder proved to be the right kidney, normal, but apparently somewhat displaced. The gall-stones removed were 130 in number; nine were as large as an os trapezium, twenty-five as large as a pea, and the remainder of the size of apple-pips.[1] The fluid drawn off by the aspirator was colourless, viscid, alkaline, sp. gr. 1006, containing no albumen, or sugar, or bile salts, but a large quantity of mucus; microscopically, nothing but granular débris could be seen in it.

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The subsequent progress of the case was most satisfactory, the temperature never rose above 99°. For the first two days the patient complained of a little abdominal pain, chiefly due to flatulent distension. For four days she was fed chiefly by nutrient enemata. On the third day after the operation some of the stitches were removed; on the seventh day all the others. There was a free discharge of bile from the fistula, necessitating frequent changing of the dressings. The fistulous opening rapidly contracted, and the amount of bile discharged was proportionally lessened. By the end of the third week about two ounces of bile were discharged daily. After the tenth day there was a good deal of excoriation of the skin around the opening, caused by the irritation of the discharge. On January 11, 1892, she left the Hospital perfectly well, but with a small fistulous opening still existing. Owing to my absence from the Hospital at this period, no operation for the close of the fistula had been performed.

On February 1, 1892, she was readmitted in order that the fistula might be closed. At this time she was in excellent health. The daily discharge of bile had increased to about four ounces. There was very little excoriation of the skin. The bowels were opened regularly, the motions being quite natural.

On March 1 a small operation was performed for the closure of the biliary fistula; an incision was made round the opening, the mucous membrane was dissected back a short distance and the cut edges united with two sutures; the skin was then united over these. On the seventh day afterwards a small quantity of bile came through the wound; this continued for about three weeks, when the fistula closed completely and permanently.

[1] These stones are preserved in the Royal Free Hospital Museum, No. 536.

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On April 5 the patient left the Hospital quite well in every respect.

The second case was that of a lady whom I saw in private at Wanganui, New Zealand, with my friend Dr. C. B. Innes, in May and June 1892.

CASE II.—*Empyema of the Gall-Bladder with Calculi—Cholecystotomy—Complete Recovery.*

Mrs. B., a widow, aged 40, the mother of several children, had always enjoyed fairly good health until the beginning of the present illness. She had always led an active, out-of-door life, and had never suffered from jaundice or hepatic colic, nor had she ever, to her knowledge, passed any gall-stones; occasionally she had had vague, slight pains about the region of the liver.

On or about May 21, 1892, she began to suffer from pain in the right hypochondrium; this increased, and she soon began to feel sick, and was obliged to take to her bed.

On May 24, in the evening, the pain became very severe, and remained so almost constantly until the time of operation. On May 25, when she was seen by Dr. Innes, the temperature was normal; the patient complained of great pain as before, and had much tenderness in the region of the gall-bladder; she was not jaundiced.

On May 27 the temperature was 101°.

On May 28 she was first seen by myself in consultation with Drs. Innes, Conolly, Saunders, and Tripe. Her condition at that time was as follows:—A well-nourished woman, with a very slight tinge of yellow in her complexion. She lay on her back in bed with her knees drawn up. She was evidently in great pain and looked very ill. The abdomen was somewhat distended. Owing to the rigidity of the muscles of the right side of the abdomen and the extreme tenderness that was present, it was difficult to make a very thorough examination. A smooth rounded tumour, apparently about as large as a golf-ball, could, however, be felt just below the costal arch, opposite the tip of the right tenth rib; it was obviously a distended gall-bladder. The patient complained of much nausea and vomited occasionally; she was unable to keep down any food. The temperature was 101°. From the extreme pain and exquisite tenderness, together with the elevation of temperature, it was concluded that the gall-bladder was acutely inflamed and probably suppurating. All who saw her were agreed as to the urgent necessity of cholecystotomy, which was accordingly performed on

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the afternoon of the same day, with the kind assistance of the gentlemen above mentioned.

A vertical incision about four inches in length was made in the right linea semilunaris immediately over the tumour. The peritoneum was quickly opened and the gall-bladder easily recognised. It was moderately distended, of a dull red colour, and had a peculiar leathery feel, as if its walls were very thick. A few trivial adhesions connecting it with the colon were severed, and warm sponges packed around it inside the peritoneal cavity. The gall-bladder was drawn up as much as possible into the wound, punctured with a small trocar, then incised to the extent of half an inch. Its wall was greatly thickened by inflammation, being at least a quarter of an inch in thickness. The fluid contents, to the amount of two ounces, were pale and viscid, and consisted chiefly of pus and mucus.

Sixty-four calculi,[1] of sizes varying from that of a marble downwards, were removed, partly by pressure of fingers outside the gall-bladder, partly by gently syringing. One stone, the largest, lay well within the cystic duct, and was dislodged after a little trouble by gentle pressure with the forefinger.

The gall-bladder, after having been explored with the forefinger and a probe to make sure that no stones remained, was then stitched to the peritoneal and muscular layers of the abdomen by a continuous silk suture on either side. The sponges having been removed from the peritoneal cavity, the external wound was sewn up with interrupted silk sutures passing through the whole thickness of the abdominal wall. The two sutures nearest to the gall-bladder were also passed through the serous coat of the latter.

During the suturing of the gall-bladder to the abdominal wall, the escape of the contents was hindered by placing a small sponge inside its cavity. A large drainage-tube was placed in the gall-bladder and the wound dressed with salalembroth gauze and wool. For the first twenty-four hours after the operation there was considerable pain, not relieved completely by ¾ grain of morphia subcutaneously. After this time, however, it rapidly subsided.

On the sixth day after the operation, bile first appeared in the dressings.

There was no vomiting at any time after the operation.

The temperature for the first few days was between 100° and 101°, but after the removal of the stitches it quickly fell

[1] These stones are preserved in St. Bartholomew's Hospital Museum, Series 53, No. 274c.

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to normal. The stitches were removed on the sixth and eighth days. After the latter date I did not see the patient again; she remained under the exclusive care of Dr. Innes, to whose unremitting care and attention throughout the illness the patient's recovery was largely due.

On June 11 she had continued to do well. The wound had united firmly everywhere except at the middle, where a fistulous opening remained. This, however, was rapidly contracting. The discharge of bile through it had diminished considerably. The gall-bladder had been washed out from time to time with warm water; no more calculi had, however, been seen. A few weeks later this fistula healed spontaneously. At the beginning of August, when I last heard from her, the patient considered herself perfectly well. She had had no return of pain or any other trouble, and was able to walk and drive, and intended shortly to resume riding on horseback, of which exercise she is very fond.

*Remarks.*—In the first case the chief interest lay in the diagnosis. The absence of hepatic colic or any other symptoms pointing to gall-bladder mischief, and the large size and mobility of the tumour, which extended downwards considerably below the umbilicus, made the diagnosis of enlargement of the gall-bladder somewhat doubtful. The fact that the tumour could be felt so plainly bimanually with one hand at the back below the last rib, made it seem rather like an unusually movable cystic tumour of the kidney. This apparent peculiarity is explained, however, by the tumour lying upon the right kidney in such a manner that, when grasped bimanually, both moved together as one mass. The second smaller tumour felt behind, and somewhat below and outside the main tumour, was undoubtedly the lower part of the kidney, perhaps somewhat displaced.

This point is perhaps especially worthy of note, since this very case had been confidently diagnosed by a well-known surgeon as one of renal cyst.

Jacobson ("Operative Surgery," 1891. p. 850) refers to a case recorded by Dr. Meads of Philadelphia, in which a distended gall-bladder so closely resembled a renal tumour that an operation was actually performed upon it through a lumbar incision.

The absence of any history of jaundice in each case is interesting, and formed one reason for believing that the distension of the gall-bladder was due to gall-stones rather than to malignant disease, in which jaundice so commonly occurs. The absence of jaundice is accounted for, of course, by the fact

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that the stones were in the cystic, and not in the hepatic or common ducts.

With regard to the thickness of the wall of the gall-bladder, the difference in the two cases was remarkable. In the first case, where the contents had been accumulating slowly for years, the degree of attenuation was extreme, no hypertrophy having occurred. During the operation rupture seemed imminent. In the second case, the thickness of the gall-bladder wall was almost equally striking, and was due, no doubt, largely to the co-existing acute and previous chronic inflammation. In neither case was much trouble experienced in drawing the gall-bladder well up into the wound before evacuating its contents.

With regard to the calculi, there can be no doubt that in each case it was the presence of the large stone in the cystic duct that had prevented the other stones from causing any trouble. This stone blocked the duct completely, and prevented the others from getting into it.

Both cases show the advantage of immediately opening the gall-bladder, and not waiting to do this by a subsequent operation after adhesions had shut off the peritoneal cavity. The latter proceeding would, no doubt, have diminished the risk of peritonitis, but, on the other hand, the removal of the stone from the duct would have been, in each case, very difficult, perhaps impossible, without the assistance rendered by one finger in the peritoneal cavity.

In the first case the gall-bladder was sewn to the skin in order that a larger surface might be in contact with the abdominal wall. This proceeding made spontaneous closure of the fistula less likely to occur, and necessitated, in fact, a subsequent operation for its closure. In the second case, in which the gall-bladder was sewn, not to the skin, but to the peritoneal and muscular layers, it was more difficult to prevent fluid from escaping into the peritoneal cavity, but, on the other hand, the fistula was enabled to close spontaneously.

Examination of the large stone impacted in the duct showed that it had originally consisted of four smaller stones which had become welded together. One of these had recently again become detached from the others, probably not many weeks before the operation. It is possible that the irritation caused by the sharp angles thus formed was one cause of the suppuration which ensued.

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# SURGERY AND INSANITY.

BY

T. CLAYE SHAW, M.D.

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The operation of trephining the skull in some forms of insanity has now been some time before the profession, and the result may be generally stated, that it affords relief, probably extends the duration of life, but in no reported case except that at the Brookwood Asylum has led to the cure of the disease. During the last few years the subject has been well ventilated, and there has been perfect honesty towards the profession in dealing with the new line of treatment. The cases selected appear to have been typical in their development; so far advanced, indeed, that whilst the diagnosis of the disease has been beyond suspicion, the mischief has been so extensive that it was probably asking too much of the operation to expect a cure. The operation was first proposed in general paralysis; but the object of this paper is to narrate a case of another form of insanity treated in like manner, and to indicate the possibility of a still more extended use of it.

Admitting that the pathology of general paralysis is obscure as regards the order in which the structures are attacked, we have yet enough to go upon for the relief of symptoms in regarding cell-destruction, excess of fluid, and a thickened and tortuous state of the capillary vessels as constant factors that have to be reckoned with. Whether the excess of fluid is primary or secondary (and I believe that it may be both), whether the vessels are varicose and aneurysmal in consequence of a primary affection of the nerve-cells, or whether the lesion begins first in the vessels themselves, the fact remains that the pressure is there, and that as long as it exists atrophy and distortion must go on. The distinct signs of pressure are pain, bulging, spurting of fluid when the tension is relaxed, and the flattening of convolutions; and all familiar with the treatment of general

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paralysis know how beneficial is the medical treatment directed to the lowering of tension, such as bleeding, free use of purgatives, digitalis, &c.; whilst, on the other hand, excitement, stimulants, too long-continued exercise, cause increased pressure and aggravate the disorder.

If the operation is to have any development, the direction will apparently lie in taking earlier measures, and perhaps in more extensive area of removal of bone. It is indeed difficult to see what other steps can be taken in a great number of cases, if once it is conceded that pressure is the evil to be got rid of. The mass of dementia with which we are confronted as the result of uncured brain-disease speaks to the inefficacy of usual methods of treatment; on the other hand, the operation itself, though apparently free from risk when carefully performed, is yet not one to be lightly undertaken, for it requires special operative facility, and is apt to be long and tedious. The main difficulty is in the selection of cases, and here we are at once brought face to face with one of the most difficult questions in lunacy—that of prognosis. One of the main objections to the operation is that unexpected recoveries are not infrequent, and that therefore any improvement that has been found in the history of related cases was not owing to the operation. Such reasoning is not quite logical, because, so far as can be seen, doubtful cases have not been submitted to this treatment; but it must be allowed that we are often deceived, and that whilst we are generally correct in the forecast, still we are oftener than can be wished either absolutely wrong, or so doubtful as to be unable to speak with any certainty. In insanity it is so often the unexpected that occurs that we take precautions that are really not needed, and we rely upon an apparent freedom from dangerous impulses to grant liberty of action when the result may show our judgment to have been in error. So much has yet to be done in our knowledge of the physical state of the brain in insane conditions, that it seems premature to expect that so apparently formidable a treatment as surgical interference shall be resorted to except in extremities, though in hospitals for the treatment of "nervous disorders" much more is done in this direction. That we cannot now forecast the issue of a train of symptoms is due to our ignorance of the laws of thought. There must be some definite reason, governed by laws, why, of two patients who show apparently the same symptoms, one is dangerous to himself and the other is not; why, of two persons who manifest delusions of persecution, one becomes homicidal and the other recovers. A certain amount of experience brought to bear on a rigid clinical examination enables us to make an

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accurate forecast in the majority of instances, but some neglected sequence leads us to blunder where we seemed most sure; and though mistakes are less numerous than formerly, and "idiosyncrasies" less frequently on the tongue, there is yet a vast amount of "meteorological uncertainty" to be got rid of before we can define mental aberration with the certainty of astronomical predictions. Let me give one or two instances to show how uncertain is our present knowledge of existing conditions.

There is a patient here now in a most distressing state of melancholic excitement, reduced to a skeleton, constantly begging to be "put in a hole and buried," and yet this man never attempts his own destruction; though, beyond expressing the confidence that he is not suicidal, we cannot give any scientific reason why he is not so. We do not like to suggest to him the question why he does not attempt to injure himself; but ought we not to be able to give the reason why he prefers to live on in the hope that others will do what he does not himself care to do? Take, again, cases of recurrent insanity. Every one knows that in the intervals of excitement of depression these persons may be perfectly well, yet there is considerable mystery as to the order of events when a recurrence begins. Does a certain part of the brain break down in function at definite periods owing to "instability" of the nervous elements, or is the attack due to a vascular change acting upon the nerve-cells and so affecting their nutrition? From the fact of exact similarity in the oncoming and progress of the recurrent attack we can gain no knowledge except that similar groups of cells are affected each time the patient is attacked—a phenomenon consistent with either hypothesis, but on the whole, to my mind at least, more easily explained by the theory that attributes the primary lesion to the nerve-elements. There are many points of resemblance between these attacks of recurrent insanity and epilepsy; for in both there is a period of mental alteration, usually of a very definite kind, so that those familiar with the ordinary life of the patient can say either that he is "going off again," or that he is going to have a fit. In both the premonitory symptoms may be exclusively mental, or exclusively motor, or (more generally) mixed; in both there may be unconsciousness of what has occurred when reason is restored; in both a definite area of brain-tissue appears to be affected, and in both the reflex life seems particularly active; but the difficulty remains of saying where the particularly affected cells lie, and treatment is directed at present chiefly to using our already acquired knowledge from past attacks to assist us in present circumstances. The surgical treatment of epilepsy is, we are told, being extensively undertaken abroad

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(not alluding, of course, to merely traumatic cases), with good results; and there appears to be no reason why, with more perfected diagnosis of locality, we should not also attempt the surgical treatment of recurrent insanity, since no more practicable way of attaining the diseased structure seems possible.

The true pathology, *i.e.*, the morbid physiology of insanity, is so far imperfect, that we cannot say what is the particular route that an attack will take, partly because the education of the individual is so different in any two cases, and partly because the qualities of the tissue seem so dissimilar; but there can be little doubt that there is a very close bond of fundamental similarity in all manifestations of brain-disease, and he is the most successful interpreter of the disease who can disregard the prominent superficialities and steadfastly keep in view the part attacked. Thus, two persons exposed to the same cause have attacks of insanity differing in their manifestations, the one showing maniacal symptoms, the other those of a depressed form. No one doubts that (other things being equal, such as absence of hereditary taint, depraved habits, &c.) the structural lesions are, in the two cases, in corresponding parts, and hence there is no reason why the same curative procedure might not be adopted. A great deal has been made of the large delusions of "general paralysis," as being an essential feature of the disease, but it requires very little acquaintance with insanity to see that these "large" delusions are only accidental; that numbers of persons go through attacks of paralytic insanity without any exhibition of "large" delusions, and that equally "large" delusions may be found in patients whom no one would think of calling paralytic in any form. The truth is, that the presence of delusions of any particular kind is accidental, it depends on the affection of a particular group of cells that have been from previous education brought into connection, and therefore, when a "general paralytic" talks of his millions and his superlative powers, it means nothing more than when the melancholy person bemoans his state of original sin, and the cruel fate that he thinks is awaiting him. The next day the two may change places, and the man who had powers incomprehensible may think himself the most abject pauper. It is more than doubtful if the person who says that he is possessed of such immense wealth and enormous power really thinks himself to be so; he most likely does not care to trouble himself over the matter, and indeed is not truly conscious of what he is saying, and this is shown by the after-statements of those who have at one time had delusions of this sort, but have recovered. To persons of sound mind

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it seems incomprehensible how an insane person can utter large delusions, and believe in them; but if we recognise that a delusion is merely the expressed constant irritation of cells, due either to inflammatory action, pressure, altered physico-chemical function, or any other of the numerous causes of irritation that may be easily enumerated, there is no difficulty in the matter at all, and we may view delusions as simply due to irregular action of groups of cells, at one time those associated with wealth and power, at another those expressive of misery and pain, and again others of no particular tendency one way or the other.

At present, we know so little of cell-action, that we cannot say if the same cell may have impressed upon it memories of opposites, such as, *e.g.*, of wealth and poverty, of light and darkness, or whether a totally new impression would require for its reception a new cell. There must be many cells, if this last statement is true, that are never called into action during a lifetime; but the most minute investigation fails to show any difference between cells that must be in constant use, and those that are rarely called upon. Take the question of fatigue. There is a female patient here who for years has made, without intermission during the day, certain definite movements implying that she is constantly thinking of weaving a fabric. She must have made millions of movements in this direction, and the central source of these movements must be very limited in its area; but I do not expect to find post-mortem any special development of any part of a convolution; nor, it is much to be feared, would any specially expert pathologist find any difference pointing to excess of function in any particular group of cells. One would expect that such a continuous manifestation of function would lead to a tired condition, and gradually to atrophy; but such is not the case, and the movements are just as vigorous at the end of the day as at the beginning. No doubt, the "explanation" of this would be that the motion is involuntary, and therefore exhaustion is not felt. We all know how tedious it is to learn a new movement, and how soon exhaustion and fatigue make themselves manifest when new work is being done, also how the new object, once attained, goes on without causing weariness; but it is difficult to understand how the "being accustomed" to a thing makes the processes of wear and repair balance each other so nicely, and by apparently a self-regulating action. In acute insanity, where the same round of ideas is most vigorously proclaimed, fatigue seems unknown, but a voluntary declamation to an equal extent would be attended by extreme prostration; and

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the same may be said of those persons in a state of chronic insanity who repeat the same phrases and perform the same acts for years without apparently suffering in any way. But take a person suffering from "nervous exhaustion" or neurasthenia, produced either by alcoholic or sexual excess, and we find him unable to perform a sustained voluntary movement for any considerable time. Let him become insane, and the difficulty disappears; the bridge over which he formerly passed with fear and trembling, he now crosses with perfect confidence; whereas before, he could not bear to sit out a service in church, he now cannot be stopped in his religious attendance —in his actual insanity he is less "nervous" than when in possession of his senses. It seems impossible to grasp the difference between these two conditions, or to attempt an explanation by any results that we have hitherto gained from morbid anatomy. It is just this controlling power of the will (whatever that may be) that we desire to see re-established; we look for the reappearance of fatigue, knowing that then rest will be of service, and the normal relationship between the two re-established; for fatigue is physiological, and one of the best signs of healthy action.

Among the causes of insanity, none is perhaps so frequent and important as "worry," which may be defined as long-continued conscious cell-action, eventuating in insanity, when, curiously enough, the fatigue of it seems to vanish. We see the insane, apparently under the most miserable conditions of life, irritated beyond measure by the refusal to grant their wishes or to agree with their statements; and yet this condition, which would be insupportable to a sane person, appears to cause neither worry nor fatigue, for the subjects of these ideas will occupy themselves, and even perform new work, with a zeal impossible to imagine if they really felt what they describe; moreover, they will joke and laugh even when spoken to about these depressing matters, as if two processes—one of conscious and the other of unconscious cerebration—were running side by side in the brain. Hence it is that many insane persons are quite able to go on quietly and transact ordinary business, I will go so far as to say even on subjects connected with their delusions. For instance, I have a patient now under care who says that he is extremely anxious to die, and is constantly asking to be put away, but he resents anything that causes him inconvenience or possible injury, and there is no doubt that what he insanely asks for does not represent the sane part of mind which he is still able to exercise, and it is probably owing to the still existing power of inhibition that he does not injure

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himself; should, unfortunately, this remaining power of inhibition become fatigued, the worst results might be anticipated.

Mesmerists and hypnotists have found great difficulty in dealing with the insane, and the reason seems to be that the brain of a thoroughly insane person is not subject to fatigue, as is that of an ordinary individual. These professors tell us that they cannot "engage" the attention of the lunatic. Certainly they cannot, because when the patient is thoroughly insane fatigue is impossible, and it is only when there are intervals of freedom from excitement (as in many epileptics), or in some with delusions of a very circumscribed type, that the condition of mesmerism can be induced. We can, therefore, easily understand why people of sound mind should be more susceptible to external influences than the insane, and it would seem that very great power of resisting fatigue is most manifest where there is least absolute consciousness. If a hypnotist is able to get an insane person to believe in his delusions as such, he will then have a chance of influencing him, because the patient will, in fact, be then on the road to that condition when fatigue is possible. In persons whose brains have been overtaxed, whether by overwork or by alcohol, or by another cause, mental exertion causes great muscular weakness, just as does excitement or shock, and this is at times carried so far as to produce actual paralysis of motion—a condition much resembling that caused by mesmerists, and one indicative of rapid exhaustion; but insane persons do not seem subject to this condition, and motor enfeeblement as a result of great mental agitation is unknown.

At present, we seem to have no means of producing exhaustion, and experience teaches us how useless narcotics are in the treatment of acute insanity. What a narcotic seems to do is simply to affect that part of the brain which is not affected by the disease—a proceeding that may be useful in masking some particular unpleasant symptoms (such as destructiveness or noise), but of no value in really affecting the insane reflex mental processes. Here hypnotism and hypnotics seem equally useless, in that they do not seem to affect diseased tissues. It is, then, no sign of congenital weakness that a person should be subject to mesmeric influence, nor does it necessarily show force of character or original strength and quality of fibre—perhaps the contrary is rather the case. How is it, then, that mesmerists often fail to produce their effects at first, but succeed after repeated efforts, as they say is the case? For a repeated subjection of certain cells to a process of education should render them more enduring and less prone to fatigue; in fact, the mesmerist's first attempt ought to be the successful one, if

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he is to be successful at all, and each failure ought to strengthen the power of resistance. I believe such would be the case if the individual really resisted the first or subsequent attempts, but it is because in the subsequent sittings he really does put himself more and more in the conditions in which exhaustion is produced. Perhaps at first he does not comply with the conditions which the experimenter desires, in which case he is just like the insane person who does not yield attention, and in him therefore exhaustion is impossible, and it is not until he has learnt to place himself in the condition that no insane person can be brought to do—that of conscious subjection—that his subordination can be completed. Ideo-motor impairment (amounting at times almost to paralysis) is the most common form of "neurasthenia," and appears to be a further development of ordinary fatigue. It may be noticed in people who suffer from this form of exhaustion, that when placed in certain conditions, and in these only, their muscular power fails. Thus a person may at one time be seized with giddiness or weakness or faintness in crossing over a bridge or in church. Ever afterwards the idea of crossing the bridge is so painful that he is unable to do it, though he can walk miles in another direction with ease and vigour, and could attend a protracted performance in a theatre or listen to a long discussion in a public hall, when to stay so long in church would be impossible. Let him once, however, have a renewal of his symptoms in fresh circumstances, and these would have to be added to the places to be avoided.

To most people unaccustomed to the practice it would be very dangerous to be placed suddenly on an ice-slope, and it is only when they are used to it, *i.e.*, when from previous experience of their safety in similar conditions they cease to think about the danger of falling, or, in other words, when cell-fatigue is impossible, that they can stay in comfort. Hence the safety of the somnambulist, of the insane person, and of the hynoptised. It would seem that courage is then either an ignorance of danger, or a consciousness of having previously passed through similar conditions with safety; and the result of a stimulant in enabling people to pass through ordeals would point to vascular weakness as the source of the trouble, and the temporary check of sufficient blood-supply as the factor in sudden fatigue or "neurasthenia." In people with congenitally weak vascular power, or in those who suffer from capillary dilatation as a consequence of over-stimulation, the condition would seem to be incurable; and I have noticed clinically that in the latter class the feeling once established is more or less present through the lifetime of the individual. If, then, vascular congestion is at the root of the

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ailment, the result must be atrophy of the cell and effusion of fluid. It cannot be said that under these circumstances there is necessarily an increase in pressure, but the presence of fluid must preserve the balance of the diseased state, and as such is probably an evil. That brain-action may go on without external modification to the casual observer (though palpable enough to the subject himself), even when a considerable amount of fluid is present, is certain, and there is little doubt that scores of people are now going about, in a way carrying on their social and business functions, whose brains are overcharged with water, the result of capillary inertness and cell-fatigue. But is the fluid found in and about the brain all compensatory? For the most part it probably is, but apparently not so altogether; and if secreted in this way, must act so as to cause pressure, and therefore atrophy of the cell-structure. But if secreted, where does it come from? There seems every indication to treat vascular changes as the primary ones in these "nerve-attacks;" but surely the cells may themselves be the first to begin, and it is more in consonance with clinical experience that this should be so. Fatigue is felt when the balance between expenditure and supply is upset, and surely the vascular service should be at the command of the cell, not the other way. The phenomena of recurrent insanity point to this, as already explained, in addition to which there is the action of vascular sedatives, which may reduce the circulation and pressure, but will not calm the excitement, whilst sleep or rest achieves both results. The fluid found normally in and about the brain is a secretion, not merely an exudation to fill space. Why should not this under conditions of brain-irritation be increased? It is so in hydrocephalus, and no one doubts the pressure there. We know from Bevan Lewis' researches that in disease the lymphatic system is much developed in extent, and a general review of the conditions points to the conclusion that where fluid exists in excess there are two sources, one being the capillary system itself, the other the original source of the serous exudation; the former probably is merely compensatory, the latter is the one causing pressure. As long as this pressure-fluid is present there must be the greatest danger to the patient, for no chance is given to the injured parts to return to their original relations, they cannot (to use the French word) *functionnate*, and hence arise irritation, dementia, loss of memory, headache, &c., and the influence for good of purgatives has been long recognised. Anything indeed which reduces the quantity of blood is of advantage, blisters and blood-letting being at times the most effectual. It would appear, then, that Mr. Harrison

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Cripps' suggestion of providing a new lymphatic system has much to recommend it, and that it is not so extravagant an idea as some recent writers have maintained. The logical conclusion from the above is rather a startling one, viz., that we must recognise much earlier than we do the importance of fluid-pressure, and adopt apparently the only means of getting rid of it.

Though perhaps impossible to demonstrate, it can fairly be assumed that the voluntary inception of a new mental process establishes more intimate relations between the cell and its vascular connections, the result being growth of the cell and the gradual acquisition of power to withstand fatigue; and yet there is a manifest difference in the effect produced by the two forms above mentioned of increased vascular action. When the circulation is quickened by direct stimulants such as alcohol, the cells are, as it were, excited against their will, they receive rude shocks of impulse for which there is no provision, and the chemical changes must be of an entirely different order from what happens when, the cell calling for an increased supply, a selection of material is made in quantity exactly adapted to the want. Hence the philosopher who uses his brain-power in the manner originally intended is saved from the dislocation of natural track and the brutal alteration of quiet growth that must happen in him whose brain-cells are pushed and harried about by a flood of material and an energy not at the time required. It must, however, be confessed that alcohol has as well a direct action on the brain-cells as on the circulation, though probably the latter is the greater. It has often seemed to me as if the cells at first resented this increased vascular action, and only took on greater display after protracted stimulation. Certain it is that having once been set going, they do not so easily settle down as when the stimulus begins in themselves. The incoördinate, or rather semi-paralysed state, of the drunkard's muscles is akin to the fatigue (ideo-motor) of persons whose central nervous system is probably in a minor condition of increased serous engorgement, from degenerative changes set up by some of the causes mentioned. The young man may after severe mental work feel tired, but muscular exercise restores him; may go through sudden excitement, but there is no shaking of the hand or desire to sit down. The older man, who uses perhaps the same set of cells, finds that mental fatigue carries muscular weakness with it, and his remedy is the arm-chair, and not the running-path. It might be urged (though I do not think the argument quite fair) that exercise, by increasing the rapidity of the circulation, ought to have the effect on the brain-cells

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that has been described, viz., of increasing their action and energy. Though not to the extent of that caused by alcoholic stimulus, I yet think that exercise does produce such an effect to a limited extent; but inasmuch as the effect ceases with the muscular effort, the parts soon quiet down and no permanent damage is caused.

We have referred already to the signs of pressure observed after opening the skull, but it is important to be able to diagnose them during the course of disease. Headache would appear to be one of the most prominent signs, although not constant. It must, however, exist oftener than patients confess, for the insane are notably bad at describing symptoms, and very often their statements cannot be relied on. Looking at the thickening of tissue, the evidences of congestion, the arterial tension, and at times the fusion of parts, it is impossible to avoid the conclusion that pain must be present in the majority of cases. Another symptom is great motor restlessness and tension, and to this may be ascribed the muscular rigidity often seen in acute insanity, whether of the maniacal or melancholic variety, in general paralysis, in the fury of epilepsy, in recurrent insanity, &c. Instead of restlessness there may be acute stupor as the result of pressure, and at present it seems impossible to say why in one case restlessness, in another stupor, should result; but there is no doubt that, whether as primary cause or not, pressure does exist. Unfortunately there is no exact pressure-gauge by which one can tell the exact amount going on inside the skull until we have opened it; but judging from post-mortem appearances and from what is seen when the skull is opened during life, it is difficult to come to any other conclusion than that not only does pressure exist, but that it is the cause of permanent destruction of tissue.

Seeing, then, that in the greater portion of cases of insanity the morbid process is much the same, that varieties in form appear to depend on the particular education of the individual and the groups of cells affected, that the pathological appearances are very similar in all advanced cases of insanity, and that our present knowledge is so limited that only in the most vague way can we associate groups of cells with ideas, and therefore cannot apply remedies to a particular part, I thought it proper to try the effect of surgical measures upon an ordinary case of acute insanity in its early stage, one associated with extreme violence and restlessness, and where medical remedies of all kinds had been tried in vain. The particulars of this case are as follows:—Arthur B., aged 28 years, a lighterman, was admitted on October 24, 1891, having previously been in a



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private asylum for four months. On admission, he was in a restless and deluded state, which gradually became more pronounced, and on November 19, about three weeks after coming in, he was very violent and tried to take away the attendant's keys. He was flushed, noisy, and impulsive, and the muscles of his extremities were in a very tense condition, so that his appearance was that of a man always on the defensive. About this time he refused food, and had to be fed artificially. All sorts of remedies were tried, but without success. We gave him subcutaneous injections of atropine, but though his pupils were dilated, there was no improvement in his resistiveness and muscular tension. Conium was also tried, but without result. He complained of pain in his head and "vibration," and I concluded that this, as well as the continuous muscular spasm, was due to some superficial irritant, most probably fluid. As the patient's condition was becoming critical, likely to end either in death or dementia, I determined (with the consent of his friends) to make an exploratory opening, with the view of enlarging it if necessary. Mr. Harrison Cripps was kind enough to perform the operation, which was successfully carried out on January 24, three months after the patient's admission. It must be borne in mind that the circumstances were not too favourable for operating. The patient was violent and resistive, and not in good general health, from having had to be fed artificially, but we found afterwards no difficulty in dealing with him, and from this point of view the case was instructive, as showing that serious surgical measures may be taken upon even troublesome and restless patients. As no special localisation of disease could be marked out, the spot chosen was practically the most convenient one, viz., over the upper third of the convolutions bounding the fissure of Rolando, and on the right side. On making the first trephine hole, and removing the disc of bone, the parts underneath bulged up into the opening; another trephine hole was then made, and the intervening bone removed by forceps, so that an opening of at least two inches long by three-quarters of an inch wide was obtained. There was no pulsation, but the brain and membrane bulged so much as to be on a level with the outer table of bone. The dura mater seemed to be slightly congested and rather dull in appearance, but otherwise normal. When incised to the extent of two inches and taken away, a considerable quantity of fluid escaped. It is difficult to be exact as to the quantity that escaped, but it is put down in the case-book as about three drachms, besides the oozing, which went on continuously, as long as the wound was open; but the most notable result was that with the escape

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of fluid pulsation of the brain returned. The dura mater and the pia were both removed over the surface of brain exposed, and the wound was closed by simply bringing down the flap of skin over it, a small drainage-tube being inserted. When examined three days after operation, the wound was found to have healed by first intention, and it may be stated here once for all that surgically the recovery in a few days was perfect.

The next day after operation he was much less resistive, quieter, and more intelligent, and took food fairly well. At first the mental improvement was marked, though soon the resistiveness came on again, and he became troublesome. It was, however, easier to manage him than before, and whereas before it was necessary to keep him in a single room, he was now treated in bed in the ward, and though resistive, was much less so than formerly; he was also less impulsive, and more reasonable. So matters went on, until there occurred what seems to be universal after operation in these cases—the gradual closure of the opening by fibrous membrane, and almost complete absence of pulsation. From previous experience of *post-mortem* results in these cases, I am inclined to think that union has taken place between this new membrane and the upper part of the brain, and that it is probably for this reason that pulsation is so little felt; so that if a puncture were now made through the membrane, it would go directly into brain-substance. Certain it is that the membrane is very firm and tense, and being inelastic, acts like the bone would have done. Had the quantity of bone removed been greater, there would have been more play in the membrane; and I am confirmed in this conclusion by another case here of a young man who was trephined, with great relief, for traumatic epilepsy. Here the quantity of bone removed was very considerable, and though fibrous membrane has formed to fill the gap (which was in the frontal region), normal pulsation can still be seen. In the case of this man (the epileptic) there was no bulging of the brain-substance into the wound, nor any escape of serum on opening the membranes. It is more than likely that in the first case serum has again accumulated, minimising the pulsation of the brain, and prevented from declaring itself by bulging, because of the deep adhesions above referred to.

To continue the review of the mental condition, the patient in the course of a month became again almost as bad as ever, requiring two attendants to accompany him when out walking, but his bodily state improved a little, and he was certainly more coherent. During June and July he became quieter in all respects, and now (end of October) he walks in the fields

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with an attendant quietly, can answer questions coherently, takes food well, and has gained flesh. He has, however, developed a hæmatoma auris on the left side, and much advancement is scarcely now to be hoped for. Though nothing beyond conjecture can be made, I think that the operation saved his life, being performed at a critical period of the disease. Here was a man restless, refusing food and requiring artificial feeding, getting no sleep, always standing at the door of his room and struggling to get out, so incoherent and unintelligible that nothing could be made of him, refusing all kinds of medical treatment and rapidly emaciating, who immediately after operation becomes quieter, and eventually, though not cured, becomes capable of holding a conversation, and can be trusted to walk alone, sleeps well, and even reads.

That the operation will ever become more than an occasional one is doubtful; it takes much time, it requires special surgical skill, and the idea of it is formidable. At best it seems only palliative, at any rate in its present development, and until we have some other means of promoting the discharge of fluid continuously, a permanent good result is not to be expected. Such, at least, appears to be the result of all our cases, and of others that have been elsewhere treated. Something more has yet to be done in putting the question of pressure beyond the doubt of the sceptical. This we hope to be able to prove by experiment beyond doubt. It is a cardinal point in the operative treatment of brain disease, and must have the fullest investigation. Recent surgery has proved how tolerant the brain is of interference, and it may be fairly prognosticated that with a better knowledge of those localities specially affected in insanity of different kinds, the application of direct interference will be of service at present beyond our dreams.

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# THREE CASES OF
# LARGE NASO-PHARYNGEAL POLYPI;
## WITH
## REMARKS ON THE REMOVAL OF SUCH GROWTHS.

BY

W. J. WALSHAM.

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Of the three forms of naso-pharyngeal polypi described in the text-books, the fibrous variety is said to be the most common. Doubtless this is so if the term naso-pharyngeal is to be restricted to such polypi as have their origin from the mucous membrane lining the post-nasal space. But if any growth occupying the space is regarded, as is usually done, as a naso-pharyngeal polypus, then, in my experience, the soft or gelatinous form is by far the most often met with. I have recently had two cases of very large gelatinous polypi occupying the naso-pharynx and left nasal chamber, and a case of a large fibrous polypus growing from the naso-pharynx under my care.

The polypus, from which the accompanying drawing was made, occurred in a girl of twelve years of age. She was sent to me at St. Bartholomew's by my friend Mr. John Adams. She had had from time to time small polypi removed from the left nasal cavity. Projecting below the soft palate was a globular red mass nearly filling the naso-pharynx, and coming more prominently into view when the soft palate was raised in the act of pronouncing the sound "Ah." It was firm, and apparently of fibrous consistence to the finger, but filled so completely the space that its connections could not be clearly made out. There was no protrusion forward of the palate, and no external deformity. On looking into the nose, a soft gelatinous-looking polypus was seen ocupying the left nasal chamber and projecting to within half-an-inch of the external meatus. The right nasal chamber was free, and the

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letters *m* and *n* could be fairly well pronounced. There had been no attacks of hæmorrhage. Notwithstanding its apparent fibrous nature, when examined from behind the palate, I was led, from the above considerations, namely, the absence of hæmorrhage and the presence of a characteristic gelatinous polypus in the left nasal chamber, and the absence, notwithstanding its size, of any of the pressure symptoms commonly produced by the fibrous and malignant forms, to diagnose the case as one of gelatinous naso-pharyngeal polypus springing from the mucous membrane about the posterior nares, and extending both forwards into the nose and backwards into the post-nasal space.

The growth was removed by curved forceps introduced behind the soft palate. It came away fairly readily, bringing with it the intra-nasal portion.

Gelatinous Naso-Pharyngeal Polypus (exact size). From a drawing made immediately after removal by Messrs. Danielsson.

The second case occurred in a young gentleman, sent to me by Mr. Agnew, of Bishop's Stortford. The polypus was unfortunately not drawn, but it was considerably larger than the one here shown. It did not project below the soft palate. This particular case was instructive as showing the value of making a posterior rhinoscopic examination in every case of nasal polypus.

On discovering the polypi in the nose, and his throat being irritable, I did not at first take a view of his post-nasal space, but set to work with the galvano-cautery from the front. After working away for some half-an-hour with no very satisfactory result, I looked behind the palate, and there discovered the reason. As in the former case, there was a large polypus

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occupying the upper portion of the naso-pharynx, and extending into the nostrils. What I had been removing was merely pieces of the inter-nasal portion. With curved forceps passed behind the palate, the whole mass, together with that within the nose, was brought away.

The polypus here shown was accurately measured by Mr. Danielsson, and is the exact size of the growth after removal. It would appear hardly credible that so large a growth could be packed away in the naso-pharynx and one nasal chamber of a girl of twelve without causing complete posterior stenosis. I imagine, however, that when *in situ* these polypi are subjected to considerable compression, and owing to their gelatinous consistency adapt themselves to the inequalities of the containing space, and that it is only after removal that they swell out in all directions, and assume the fat globular appearance represented in the drawing. The obstruction posteriorly was certainly not complete; she could breathe with comparative ease through the right nostril, and the *m* and *n* sounds were well pronounced.

The third case was one of fibrous polypus, which was admitted under my care at the Metropolitan Hospital. For the notes of this case I am indebted to our Senior House-Surgeon, Mr. Frazer. "J. L., a boy aged 12, was admitted June 8, 1892, with a history that for the last two months he had suffered from severe attacks of epistaxis. He was deaf on both sides, could not breathe freely through the nose, but the *m* and *n* sounds were fairly distinct. Anteriorly nothing could be seen in the nasal cavities; but on looking into the mouth, the soft palate was seen to be depressed and pushed forward on the left side; and on introducing the finger behind the palate, a firm, exceedingly hard mass, with a broad pedicle, was discovered growing from the roof of the naso-pharynx, close to the left choana. The soft palate was quite free. On the 17th Mr. Walsham split the soft palate in the middle line, introduced a wire écraseur through the nose, and worked the wire round the base of the growth by the finger in the mouth. The écraseur was slowly tightened, great resistance being met with. One wire broke during the operation. The hæmorrhage was fairly free. On the separation of the polypus the stump was destroyed by the actual cautery, and the palate drawn together by horse-hair and fishing-gut sutures. The wound united well. On his discharge on July 8, his hearing was improved; he no longer snored at night; his nasal respiration was free, and there was no evidence of any return of the growth. When last heard of, he was still well. The polypus, which was the size of a Tangerine

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orange, presented the ordinary character of a fibrous growth in this region."

It is important to distinguish between the gelatinous and the fibrous forms, as they require very different treatment. The gelatinous, in my experience, can always be readily and effectually dealt with by curved forceps passed behind the palate; the fibrous form requires more cautious management. If the galvano-cautery loop can be passed over it, and the peduncle is small, it can be cut off in this way, and the base of attachment destroyed by the post-nasal electrode. When large, it is better to split the soft palate, and if necessary, cut away part of the hard, to obtain a good exposure. I have now done the operation several times by splitting the palate for the removal of fibrous growths from this region. I have always found it give ample room for the application either of the cold or galvano-cautery snare, and for the subsequent manipulation for destroying with the actual cautery the base of attachment.

So far I have found the method so satisfactory, that I should certainly, except perhaps under exceptional circumstances, employ it in preference to what I hold to be the much more dangerous procedure of partial resection of the jaw, after the method of Langenbeck, or complete removal of the superior maxilla. The less severe methods of turning back the ala of the nose, splitting the nose in the middle line, or reflecting the upper lip after the method of Rouge, cannot be compared with splitting the palate as regards the amount of exposure thus obtained. To attempt to remove these fibrous polypi with forceps, like the gelatinous, without a good exposure, and even with it, is, I am sure, a highly dangerous procedure. The growths are extremely vascular when cut into. I have seen blood pour from them, when attempts have been thus made, in a regular stream, and, moreover, they may encroach upon the cranial cavity, which may be opened during violent attempts at removal with forceps.

After splitting the palate, the edges should, of course, be carefully protected, and drawn aside by threads passed through them, till the removal of the growth is completed, when they must be brought together accurately, as is done in the closure of the cleft in the ordinary operation for cleft palate.

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# INTRA-THORACIC GROWTHS.

BY

VINCENT D. HARRIS, M.D.

Since the publication of the classical lectures upon intra-thoracic growths by Sir Risdon Bennett in 1872,[1] but few attempts have been made in this country to bring together and to contrast any large number of cases of growth within the chest. The cases of the kind recorded from time to time in the medical journals and in the Proceedings of societies are, generally speaking, individual cases of some particular kind of new growth, and many even of these have been reported merely as local manifestations of malignant disease which has attacked the whole body, or as illustrating some particular symptom as a means of diagnosis. We must except from this category, however, Dr. Lindsay Steven's recently published and very interesting lectures upon the "Pathology of Mediastinal Tumours with special Reference to Diagnosis,"[2] a notable contribution to the literature of the subject. Turning to the Continent, several important monographs, too, have appeared before and since Bennett's, notably by Riegel,[3] Eger,[4] and Pless,[5] and a very good epitome is to be found in the volume of Ziemssen's "Cyclopædia of Medicine," on "Disease of the Respiratory System," by Hertz, and in America Dr. H. A. Hare[6] has brought together an enormous amount of information bearing upon intra-thoracic growths.

Having had the opportunity which a special hospital for chest diseases gives of seeing several cases of intra-thoracic tumour

[1] Cancerous and other Intra-Thoracic Growths, being the substance of the Lumleian Lectures, 1872.
[2] Lewis, 1892.
[3] Virchow's Arch., Bd. xlxix. p. 193.
[4] Zur Pathol. der Mediastinaltumoren, Breslau, 1872.
[5] Dissert. Inaug., Göttingen.
[6] The Pathology, Clinical History, and Diagnosis of Affections of the Mediastinum other than those of the Heart and Aorta. By Dr. Hobart Amory Hare, of the University of Pennsylvania (1889).

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during the past few years, it occurred to me that it would be worth while to bring together the notes of these cases for the purpose of comparison. They have been distributed pretty equally among the patients of the different physicians of the Hospital.

In most of the articles upon this subject it has been customary partially to distinguish intra-thoracic growths into two classes, viz., into mediastinal tumours and tumours, or new growths, of the lungs (the latter being frequently treated of under the head of cancer of the lungs). In Sir Risdon Bennett's work, already alluded to, a greater subdivision appears, and he treats of the subject under no less that four heads, viz., (1) cancerous deposits disseminated through the lungs; (2) cancerous disease limited to certain parts of the lungs; (3) mediastinal cancerous tumours; and (4) non-cancerous intra-thoracic growths.

It is, no doubt, often quite possible to make out the point of origin of a growth, so far as the large question as to whether this has been in the mediastinum or in the lung is concerned, and criteria may exist in many cases to distinguish the kind of growth, at any rate to a certain extent; but in the notes of the cases which follow it is not proposed to adopt Bennett's classification, or the wider division into the two classes usually received; it will be sufficient to distinguish the individual case as belonging to the two main classes already indicated; as far as is known, they were cases of malignant disease.

*Frequency of the affection.*—It is true that intra-thoracic new growths are among those disorders which are usually classed as rare diseases; but at the same time they are sufficiently common to form a regular and fairly definite proportion of the annual autopsies of any large hospital. This will be at once evident from the following figures. The City of London Hospital for Diseases of the Chest, Victoria Park, may be supposed to treat about 900 cases of in-patients annually, and of these about 10 per cent. die. During the past ten years, somewhat less than 900 deaths have taken place at the Hospital, and of the 900 (rather less than more), 21 have been cases of intra-thoracic growths, *i.e.*, about 2.3 per cent. In addition to this, 7 cases left the Hospital to die, so that in the decade 28 cases of intra-thoracic tumour were admitted into the Hospital. The cases were distributed in each year as follows:—1883, 3; 1884, 2; 1885, 1; 1886, ?0; 1887, 7; 1888, 2; 1889, 5; 1890, 2; 1891, 4; 1892, 2. Very careful notes exist of the cases from 1886 onwards, and of several the notes have been already epitomised and published in the Pathological Report of the

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years 1886 and 1887 by Dr. Sidney Martin, the then pathologist. The remainder of the notes have been edited and the autopsies fully described by his successors, Drs. Frank Wethered, Hadley, and Arnold Chaplin. To all of these gentlemen I would acknowledge my great indebtedness for their careful descriptions, and to the last named I would also acknowledge an additional debt for the trouble he has taken in looking up the records for me.

For the sake of comparison I have taken the reports of the medical registrars of St. Bartholomew's Hospital for ten years, viz., from 1882 to 1891 inclusive, and find that during that period there have been no less than 41 cases of such growths, the total number of medical (in-patient) cases annually being roughly about 2000, and of these about 500 to 600 may be supposed to be the average number of cases of diseases of the respiratory system; this gives about four cases a year, or one case of intra-thoracic growth in 500 of all the medical cases, or 1 in about 150 of cases of diseases of the respiratory system. Of course, all of these statistics are only approximate, but they are sufficient to demonstrate the fact that the disease is a fairly constant cause of patients seeking relief at Hospitals.

*Etiology.*—As regards *sex*, the proportion of males to females among the patients suffering from the disease under discussion in the 41 cases at St. Bartholomew's was as follows:—33 males and 8 females, *i.e.*, about 4 to 1. In the 28 at Victoria Park the proportion was somewhat different, viz., 19 to 9, or rather more than 2 to 1. These figures contrast with Bennett's statistics, 39 cases; 20 males and 19 females; Eger's, 58 cases; 37 males and 21 females; and in Riegel's, the proportion was 2.4 males to 1.1 females.

Next, as regards *age*, that which appears to be most frequent in the St. Bartholomew's cases is the period from 30 to 50, 21 out of 41 patients being of that age; so too in the Victoria Park cases, the largest number being included therein, viz., 9 out of 27. This is in agreement with Eger, 21 out of his 55 cases being aged between 30 and 50. The period most prone to the disease after this is the preceding decade, viz., from 20 to 30, 16 cases of Eger's being included in it.

As regards the various supposed predisposing causes which have been mentioned, viz., *injury*, *catching cold*, and *hereditary tendency*, in the notes of the Victoria Park cases no such circumstances which could justify the belief that either had been a cause of the disease were noted. One case dated from an attack of influenza. Nothing definite can be said about occupation in connection with the causation of this disease.

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The analysis of the symptoms of the cases will be better followed if short notes of those which are fairly complete be now appended; but first of all, the statement of the 41 St. Bartholomew cases, without their clinical notes, may not be uninteresting.

CASES OF INTRA-THORACIC GROWTH IN ST. BARTHOLOMEW'S HOSPITAL DURING THE YEARS 1882–1891 INCLUSIVE.

(*From the Reports of the Medical Registrars, Drs. West and Ormerod.*)

1882.—Males, 5; females, 3; total, 8. Of these, the ages were as follows:—One was under 10; one was 10 to 20, died in Hospital; one was 30 to 40; two 40 to 50, died in Hospital, and one discharged; and two were between 50 and 60; one died, and one did not die in Hospital. Of those who died, one, a man aged 18, had a tumour in the anterior mediastinum, with pus in right pleura and trachea flattened, and a woman, aged 38, had cancer (variety not stated) of both lungs and left breast.

1883.—Males, 4; females, 1; total, 5. Of these, two were under 10, one between 20 and 30, one between 30 and 40, and one over 50; the last named was the only one of the five who died in Hospital. The tumour in this case was a sarcoma, which not only involved the glands of the neck and mediastinum, but also the skin.

1884.—Males, 2; females, 0; total, 2. Of these, one was between 40 and 50, and one between 50 and 60. Neither died in Hospital.

1885.—Mediastinal tumour, 1 male and 1 female; cancer of lung (variety not stated), 1 male; total 3. Of these three, two died in Hospital.

1886.—Males 5, females, 0; total, 5. Of these five, one was aged between 20 and 30, one 30 to 40, two 40 to 50 and one over 60. Not one of them died whilst in Hospital.

1887.—Malignant disease of the lung, 2 males; mediastinal tumour, 1 female; total 3. Of these, two males died in Hospital; one, aged 46, had a hæmothorax, which was discovered before death, and post-mortem showed a soft new growth springing either from the pleura or from the periphery of the right lung, and filling the pleura and lung substance with hæmorrhage. In the other case, male aged 45, there was left pleural effusion, which had required tapping several times before death, and post-mortem there was found a new growth at the root of left lung.

1888.—Males, 3; females, 1; total, 4. Of these cases, all

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died, three males between 30 and 40; one male, aged 38, signs of catarrh with dulness of the left base, died with an attack of hemiplegia, and post-mortem there was a new growth of left lung, with pneumonia of the left base; the second male, aged 38, post-mortem almost all of the right lung packed with a new growth; this jutted into the right auricle; there were besides growths in the pancreas, left Poupart's ligament, and neck. The third case, male aged 31, absolute consolidation of right lung, which projected into the pericardium and vena cava superior.

1889.—Cancer of lung, males, 2; females, 0; total, 2. Of these, one male aged under 10 died in Hospital, and one aged 50 to 60 did not die in Hospital.

1890.—Males, 4; females, 1; total, 5. All of these died in Hospital. Two males aged between 10 and 20, one between 30 and 40, and one female over 60.

1891.—Males, 4; females, 0; total, 4. Two died in Hospital, one 20 to 30, one over 60. Two who were discharged, one was 20 to 30, and one 40 to 50.

The notes of one of the males who died in 1891, kindly furnished by Dr. E. Cautley, is here appended.

### *Primary Sarcoma of the Left Lung.*

Peter B., aged 24, confectioner.

*Duration of illness.*—About six months.

*Symptoms.*—Cough; shortness of breath; pain in right shoulder; some insomnia; the cough is accompanied with scanty expectoration; decubitus left. During his illness was tapped no less than four times without effect.

*Physical signs.*—On left side, the side more prominent, movement deficient; vocal fremitus and resonance diminished; absolute dulness all over the left side and bronchial breathing; dulness extends to the right of sternum.

*Post-mortem examination.*—The left lung was infiltrated by a soft new growth, appearing to have its origin in the bronchial glands. The growth involved the œsophagus and left bronchus, which latter was quite disorganised and finally obliterated. The whole of the left lung was more or less stuffed with nodules of new growth of all sizes. The bronchi, such as were left, were filled with a white creamy material. The pericardium was involved and infiltrated with new growth, which had set up pericarditis.

*Microscopical examination* proved the growth to be a sarcoma.

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EPITOMISED NOTES OF THE CASES OF INTRA-THORACIC GROWTH IN THE VICTORIA PARK HOSPITAL DURING THE YEARS 1886–1892 INCLUSIVE.

CASE I.—*Primary Sarcoma of Anterior Mediastinum extending to Right Lung.*

Mary Ann S., aged 55, married.

*Duration of illness.*—Ill altogether before death eight months, with loss of flesh, night-sweats, and for two months and a half streaky hæmoptysis.

*Symptoms.*—Cough, with nummulated and brick-red sputum. Emaciation. No pain. No bacilli in sputum.

*Physical signs.*—Prominent veins in neck and over the right side of the chest. Absolute dulness to the third rib in front and to the midscapular region behind on right side. Bronchial breathing and pectoriloquy over area of dulness, with occasional crepitations under the clavicle.

*Post-mortem examination* showed that both pleuræ were totally adherent, the right upper lobe very firmly behind. A growth in the upper part of the anterior mediastinum, extending from the suprasternal notch to the third rib, stretching across and touching both lungs, but only connected with the upper lobe of the right. Backwards, extending to the posterior mediastinum, surrounding and infiltrating the root of right lung; growth continuous with enlarged glands on either side of the trachea, and with small enlarged glands above the clavicle. The growth in the right lung passed upwards from its root into the upper lobe, which was hard and entirely replaced by the new tissue. There were several necrotic patches in the upper lobe, leaving distinct cavities. No new growth in the other parts of the right or in the left lung.

On *microscopic examination* the growth was found to be a round-celled sarcoma.

CASE II.—*Primary Sarcoma of Anterior Mediastinum extending into the Right Lung.*

William C., aged 42, labourer.

*Duration of illness.*—Nine months; with cough and increasing dyspnœa.

*Symptoms.*—Cough and dyspnœa with expectoration, once of half an ounce of blood. Œdema of the lower eyelids, right arm, and front of chest. Veins of neck and front of chest dilated. Three and a half pints of clear serum were withdrawn from the

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right of chest about three and a half months before death. Negative symptoms, no pain or irregularity of the pulses or pupils.

*Physical signs.*—On the right side. Dulness over the whole of the right chest, extending to the left of the sternum. Vocal fremitus diminished above, and absent in axilla. Bronchial breathing over dull area.

*Post-mortem examination.*—A very large growth about the size of a cocoa-nut in the anterior mediastinum, chiefly on the right side, pushing the aorta to the left, adherent to the innominate artery and to the innominate veins, which were impervious. Growth extended into the right lung, forming in it a mass about the size of a hen's egg, and also into the posterior mediastinum. A considerable amount of fluid in both pleuræ, 28 ounces of pus in right and 70 ounces of clear serum in left. No other marked abnormality in the body.

*Microscopic examination* of the growth proved it to be a round-celled sarcoma.

CASE III. — *Primary Sarcoma of the Anterior Mediastinum, extending into and involving the whole of the Right Lung.*

A. B., aged 24, housemaid.

*Duration of illness.*—Eleven months.

*Symptoms.*—Severe dyspnœa. Paroxysmal pain in the right side, and slight continued fever.

*Physical signs.*—On the right side, some bulging of the side. Deficient movement, and absolute wooden dulness, extending to the left of sternum.

*Post-mortem examination.*—A large growth under the sternum in the anterior mediastinum, pushing the heart to the left, and occupying the whole of the right lung excepting a small area behind and at the base. The growth was nodular.

*Microscopic examination* showed the growth to be a sarcoma.

CASE IV.—*Hard Carcinoma of Œsophagus, Tracheal, Bronchial, and Anterior Mediastinal Glands, Thyroid, Vertebræ, Liver, &c.*

M. S., aged 21, stickmaker.

*Duration of illness.*—Eight weeks.

*Symptoms.*—Gradually increasing and extreme dyspnœa, with stridulous paroxysmal cough; emaciation; constriction of throat.

*Physical signs.*—Sonorous rhonchus all over the front and back of chest. No œdema.

*Post-mortem examination* showed that the œsophagus at its commencement, and for 2 or 3 inches, was thickened and adherent to the trachea; much constricted below the thickened part,

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and afterwards dilated for about an inch. Nothing larger than a blowpipe could pass the constriction. On section, no lumen could be distinguished in the tumour, which infiltrated the walls of the gullet for 2½ inches, white and very hard. Some smaller deposits below this main tumour. Trachea much pressed upon, chiefly opposite the second to the fourth rings of the tube. Lymphatic glands by the side of the trachea, the bronchial, and anterior mediastinal glands also enlarged, and of almost cartilaginous hardness. Upper and posterior two-thirds of the thyroid infiltrated with new growth. At the apex of the left pleura, the glands at the root of the neck were united with the bodies of the first three dorsal vertebræ by new growth. Some small deposits of new growth in both pleuræ. In liver there were three deposits of the same nature as the new growth elsewhere.

*Microscopic examination* showed that the new growth was carcinomatous. The growth had commenced in the œsophagus at the upper part, and there were secondary deposits in the thoracic glands, pleuræ, and liver.

CASE V.—*Encephaloid Carcinoma of Stomach, with Secondary Deposits in Right Lung and Liver.*

S. S., aged 78, draughtsman.

*Symptoms.*—Emaciation; pain chiefly in connection with taking food; loss of appetite; enlargement of liver.

*Physical signs.*—There were no signs indicating involvement of the lung.

*Post-mortem examination* showed that the stomach at the cardiac two-thirds was implicated with a new growth, which also extended up the œsophagus for an inch or more. In the right lung, at the apex behind, was a semi-solid area, pigmented and tough, with one or two points of softening. A distinct tumour was also found in the anterior half of the left lobe of the liver about the size of a cocoa-nut.

*Microscopic examination* proved the tumours to be of the encephaloid variety of carcinoma, the primary disease being in the stomach, and secondary deposits occurring in the liver and right lung.

CASE VI.—*Mediastinal Tumour involving the Right Lung.*

James D., aged 48, coal-carman.

*Duration of illness.*—About four months, with pain in the back, dry cough, increasing dyspnœa (six weeks), and swelling of face and right side.

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*Symptoms.*—Cough of considerable severity, with slight frothy sputum. Spitting blood occasionally; emaciation; dyspnœa increased on exertion, and on lying down.

*Physical signs.*—Face very bloated, and with great lividity of lips, ears, and extremities. The right side of face much more markedly swollen than the opposite, the right eye being opened only with difficulty in the mornings. Throughout the right side, including neck (which was broad), chest, abdomen, and right arm, there was very obvious œdema of the tissues; the right breast very prominent, and pushed towards the right. The superficial veins markedly enlarged on both sides, being more prominent on the left, as on that side there was less œdema than on the opposite.

Stony dulness on the right side of chest from apex to base, front and back. High-pitched bronchial breathing at apex, but breath-sounds more and more feeble from apex downwards. Vocal fremitus and resonance greatly diminished. In the abdomen, dulness on the right side as far as the umbilicus; below this comparatively resonant. The physical signs on the left side normal. The supra-clavicular glands enlarged on both sides. Measurement of the right chest 20 inches, of left chest 18½ inches, increased in the former case in the course of a week to 21 inches.

During the period of the patient's stay in Hospital, *i.e.*, from the 12th to the 31st of October 1891, the physical signs, if anything, increased; the voice, which was markedly laryngeal to begin with, became more so, and there were frequent attacks of dyspnœa, and the breathing became altogether more laboured, with attacks of hæmoptysis.

The diagnosis of mediastinal tumour was apparently quite justified, as, in addition to the above positive signs and symptoms, there were these negative ones: no marked inequality of the radial pulses; no marked differences in the size of the pupils; no pulsation or tumour in the chest. No cardiac signs of any description. The patient left the Hospital at his own request.

CASE VII.—*Mediastinal Tumour involving the Left Lung.*

William B., aged 42, milkman.

*Duration of illness.*—The exact duration of the present illness very uncertain, as the patient had been suffering from subacute Bright's disease for nearly a twelvemonth before admission. At any rate, it would be safe to say that the present illness was not longer than of six months' duration.



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*Symptoms.*—Cough, very troublesome, and with mucous frothy expectoration; no blood in sputum; emaciation; breath very short.

*Physical signs.*—The most marked signs were absolute dulness throughout the whole of the left side, extending to the right edge of sternum, with diminution of vocal fremitus and resonance; the breath sounds were also much diminished. There was some œdema of the abdominal walls and of the legs. No albumen was found in the urine, which was pale, acid, of specific gravity 1024, and contained neither albumen nor sugar. The diagnosis of mediastinal tumour was come to. There was no fluid in the chest withdrawn after careful tapping; no inequality of the pulse in radials, nor of the pupils, and no laryngeal symptoms. No pulsation to be noticed in the chest, and no abnormal cardiac signs. Patient did not die in the Hospital, in which he remained for three months with little or no alteration in his condition.

CASE VIII.—*Primary Sarcoma of Anterior Mediastinum, spreading into and involving the whole of the Left Lung.*

Margaret M., aged 31, housewife.

*Duration of illness.*—About ten weeks before admission, and was in Hospital about four weeks before death, so that the whole period of disease was about fourteen weeks.

*Symptoms.*—Cough very troublesome, and accompanied by scanty and occasionally blood-stained expectoration. Hæmoptysis to the extent of half a pint at the commencement of illness. Loss of flesh. Dyspnœa.

*Physical signs.*—Face and neck puffy and congested; bluish. Two enlarged glands, one on either side above clavicles, that on right hard and extending deeply; clubbing of fingers. The left chest, impaired movement and impaired resonance all over the front and behind to the mid-scapular region downwards; vocal fremitus lost, and vocal resonance feeble over dull area. The right chest appeared to be normal. Enlarged glands in the left axilla; left arm swollen and somewhat livid; superficial veins over upper part of sternum somewhat distended. The radial pulse could not be felt on the affected side at the latter part of the patient's life.

*Post-mortem examination.*—The anterior mediastinum was occupied by a large growth which spread into the left lung, along its root and up into the neck, where the cervical glands were much enlarged and occupied by a growth (lympho-sarcoma). On section, the growth was white and softish, and the whole of

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the left lung was entirely invaded throughout its whole tissue. The left bronchus was found to be invaded and made irregular by invasion of new growth. The mesenteric glands were sarcomatous, but there were no other secondary deposits.

*Microscopically.*—Round-celled sarcoma.

CASE IX.—*Primary Sarcoma of Anterior Mediastinum, passing up into and involving the whole of the Upper Lobe of the Left Lung.*

George P., aged 50, by occupation a corn-porter; height 5 feet 4 inches; weight 10 stone 8 pounds; married.

*Duration of illness.*—About six months before admission; was in Hospital a month before death; total, seven months.

*Symptoms.*—Cough, and sharp pain in left shoulder at onset of illness. During stay in Hospital had a troublesome cough but little expectoration, which was only occasionally blood-streaked; slight loss of flesh; some, but not much, dyspnœa. Complained a good deal of pain, but in no other respect inconvenienced. Voice was feeble. The patient was most apathetic.

*Physical signs.*—Absolute and resisting dulness over the upper part of the left chest to fifth rib and behind to the lower angle of the scapula, with loss of respiratory movement; fremitus and vocal resonance greatly diminished; tubular breathing at the left base behind; fulness above left clavicle. During stay in Hospital developed gangrene of the left lung, which followed upon an attack of acute pneumonia of the left base, and died of increasing asthenia, accelerated by acute pericarditis.

*Post-mortem examination.*—The left lung was solid, and the mediastina were entirely occupied by a new growth, the great vessels and nerves being entirely ensheathed in the tumour. On section, the left upper lobe and a considerable portion of the lower lobe were entirely occupied by the new growth, which was solid and white. The root of the lung was involved in the growth, which had evidently commenced in the mediastinum, and passed up the root of the lung to the upper lobe primarily. There were enormous masses of similar growth in the abdomen, involving the pancreas, and adherent to the spleen and kidneys, the mesenteric glands being also occupied by similar material. The pericardium was studded with new growths in small masses, and was covered with a deposit of blood-stained lymph. Small growths could also be made out in the left bronchus and trachea, elevating and rendering irregular the mucous membrane.

*Microscopic examination* showed the material of the new growth to be a round-celled sarcoma.

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CASE X.—*Probable Carcinoma of Left Lung.*

John L., aged 68, labourer.

*Duration of illness.*—Six months. Began with pain in left side, increased on a deep breath, and dry cough.

*Symptoms.*—Dry cough; difficulty in breathing, and emaciation. Tapped to the extent of 24 oz. of fluid once in the course of his stay in Hospital. Pain in side occasionally.

*Physical signs.*—On the left side: Distinct bulging; side measures three-quarters of an inch more than the right. Impaired movement and absolute dulness, which does not extend across the middle of the sternum. Vocal fremitus absent over area of dulness. Heart apparently displaced to right. Breathing feeble over the left side. Pectoriloquy above and just below left clavicle.

Patient died after his pleura had been opened and discharged for a month a foul-smelling discharge. No autopsy.

CASE XI.—*Primary Sarcoma of the Mediastina, extending into and chiefly affecting the Lower Lobe of Left Lung.*

Charlotte G., aged 12.

*Duration of illness.*—Three months before admission, and was in Hospital ten days before death. Had been ailing for three years before the last attack, which commenced with pain in the left side, shivering and cough, but had often had such attacks before.

*Symptoms.*—Cough, with gradually increasing dyspnœa. Blue lips. Prominent veins over the upper part of the back of chest. Sputum frothy and mucous. Negative: no pain, hoarseness, inequalities of the pulses, or of the pupils. No hæmoptysis nor bacilli in sputum.

*Physical signs.*—On left side: Slight flattening below clavicle, and contraction of the whole side. Resonance below clavicle impaired, and absolute wooden dulness over the remainder of the chest, front and back. Weak breathing sounds over the whole side, with the exception of the area immediately underneath the clavicle, where it was harsh in character. No added sounds. Over the right side there was a considerable amount of rhonchus before death. Heart's apex was felt in the left nipple-line. Some epigastric pulsation.

*Post-mortem examination.*—Body not greatly emaciated. In the left pleura were two collections of fluid, one at the apex, and the other corresponding with the fourth to sixth costal cartilages. Adhesions of the left lung to the diaphragm and to chest-walls; right lung non-adherent. Left lung greatly enlarged, and bulging forward when the chest opened; entirely

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occupied by a new growth, except at the extreme apex and the upper part of the upper lobe in front, where the lung-tissue was collapsed. This growth extended behind to the root of the right lung, compressing the vessels of that region, and forwards into the anterior mediastinum in lobulated masses, implicating the pericardium as well as the left phrenic and left vagus nerves. The growth, which was found to affect chiefly the left base, was generally firm on section, but soft here and there, although nowhere broken down into cavities. Its colour white. In the pericardium were about 4 oz. of blood-stained fluid. There were no other marked changes to be found elsewhere.

The growth proved to be, on *microscopic examination*, a round-celled sarcoma.

CASE XII.—*Primary Sarcoma of Pancreas, with Secondary Infection of the whole of the Lower Lobe of Right Lung.*

Annie B., aged 43.

*Duration of illness.*—Several months, more than four.

*Symptoms.*—Extreme emaciation. Tumour developed in the right axilla about four months before death, the skin being at first movable over it, but afterwards became adherent. It was excised and proved to be a round-celled sarcoma.

*Post-mortem examination* showed a large growth, hard and white, about the size of a cocoa-nut, occupying the pancreas, except its head. The lower lobe of the right lung was entirely occupied by a growth, and considerably enlarged, pearly white, and in places pigmented. Softened spots also found here and there in the mass, but no cavities. Several small growths in the central nervous system.

*Microscopic examination* showed that the growth, wherever found, was of the same nature, viz., round-celled sarcoma. The pancreas appeared to have first of all been attacked, after which various secondary deposits took place in various parts.

CASE XIII.—*Primary Sarcoma of the Right Lung.*

Walter F., aged 53, porter.

*Duration of illness.*—About four months. Apparently caught cold.

*Symptoms.*—Pain across the loins and weakness. Cough, with slight muco-purulent expectoration; no blood.

*Physical signs.*—On the right side, dulness at apex and impaired resonance over the whole side. Vocal resonance and fremitus diminished. Breathing deficient. Some rhonchus. Epigastric pulsation. No marked enlargement of veins.

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*Post-mortem examination.*—The right lung, as regards the upper lobe, was completely infiltrated with a new growth, the upper portion of which was white and solid, whilst the lower part was soft and decomposed. In the remainder of lung were small patches of new growth.

There were no other deposits in the left lung or elsewhere.

*Microscopic examination* showed that the growth was a small and round-celled sarcoma, with an excess of fibrous tissue.

CASE XIV.—*Primary Sarcoma of the Anterior Mediastinum, involving nearly the whole of the Right Lung.*

Albert P., aged 37, gas-stoker.

*Duration of illness.*—Somewhat doubtful; was ill two years before admission, but the present disease probably dated only three months before admission, and was in Hospital 4½ months, so that the total duration was about 7½ months.

*Symptoms.*—Slight cough, gradually becoming worse, with slight lumpy blood-stained expectoration. Great debility and emaciation. Pain in the right side. Dyspnœa on exertion. Some fever. At the latter stages was more or less livid and constantly expectorated at night; some blood. Œdema of scrotum. Symptoms and signs of acute pericarditis complicated the case before death.

*Physical signs.*—Veins prominent and distended, chiefly on right side of chest and neck, and also of the abdomen. Face bloated and livid. Absolute dulness over the right lung except at the extreme apex. High-pitched bronchial breathing at this spot, breathing absent over lower lobe. Pulses equal.

*Post-mortem examination.*—The whole of the right lung, except at the surface of the upper part, was occupied by deposits of new growth, some as large as the fist. The largest masses were found towards the root of the lung. These masses at the root of the lung were continuous with a large mass in the anterior mediastinum, completely filling it and being adherent to the sternum. In it were enveloped the large vessels, the carotids, and subclavian arteries and innominate veins and superior cava. The pericardium was thickened and affected with small growths similar to those in the mediastinum, producing pericarditis.

*Microscopically* the growth was a lympho-sarcoma.

CASE XV.—*Primary Sarcoma of the Anterior Mediastinum involving the Left Lung.*

Mary Ann T., aged 62, housewife.

Was admitted into the Hospital, and died on the third day,

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without being able to give any account of her illness. No thorough examination of her chest was made.

*Post-mortem examination.*—Springing from the anterior mediastinum, and immediately surrounding the bifurcation of the trachea and the commencement of the pulmonary artery, was a soft growth, quite brain-like. It implicated the left lung at its root, and there were in addition numerous deposits throughout the lung, some of which were broken down into pultaceous, almost purulent matter, whilst the surrounding lung-tissue was in a state of pneumonic consolidation, being stiff, solid, and greyish-yellow. There was a clot in the pulmonary artery.

On *microscopic examination* the growth proved to be a round-celled sarcoma.

### Case XVI.—*Primary Sarcoma of the Anterior Mediastinum, involving both Lobes of the Left Lung.*

Freeman A., aged 45, carpenter.

*Duration of illness.*—Three months. Illness commenced with cough and spitting, hæmoptysis, and loss of weight. Was thirty-five days in the Hospital before death.

*Physical signs* pointed to phthisis of both lungs, especially the left.

*Post-mortem examination.*—At the upper part of the anterior mediastinum, inclining to the left side, was a new growth, spreading upwards into the neck for two inches. It was also spread out over the pericardium. On section, the growth was seen to travel from the anterior mediastinum into the root of the left lung, running into and entirely involving the two lobes. The character of the growth was firm and solid. The left lung in the places not entirely obliterated by the new growth was the seat of chronic tubercular disease.

On *microscopic examination* the growth proved to be a sarcoma.

### Case XVII.—*Sarcoma of the Left Lung.*

Harry H., aged 36, cabinetmaker.

*Duration of illness.*—His illness commenced three months before admission, and he lived in Hospital just eight days before death.

*Symptoms.*—Pain in both sides of chest; cough, with scanty expectoration; slight hæmoptysis.

*Physical signs.*—On left side, absence of breath sounds and vocal fremitus; absolute dulness. Râles in the right lung.

*Post-mortem examination.*—The upper lobe of the left lung was

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found to be almost entirely occupied by a new growth, except at the apex behind; the lower lobe was entirely so affected. The root of the lung was completely hidden by the tumour and by greatly enlarged glands. There were no indications that the growth had commenced at the root of the lung. There were small patches of new growth on the right lung. The tumour, together with the larynx and the right lung, weighed 12 lbs. 6 oz.

*Microscopically.*—The tumour was a round- and spindle-celled sarcoma, with excess of fibrous tissue.

CASE XVIII.—*Primary Sarcoma of the Left Lung.*

Mary Ann K., aged 48, housewife.

*Duration of illness.*—Five months before admission, and was in the Hospital one week; but apparently began to cough ten months altogether before admission. Onset of illness was very gradual.

*Symptoms.*—Pain in the left side and swelling of the abdomen. Slight cough and scanty expectoration. No hæmoptysis.

*Physical signs.*—Absolute dulness, and absence of breath sounds, and of vocal fremitus on the left side.

*Post-mortem examination.*—The lower lobe of the left lung was found to be entirely occupied by a new growth, white and hard. The glands around the growth were greatly enlarged, and the pleura was enormously thickened, and presented almost a honeycombed appearance. There were also deposits in the pericardium, producing pericarditis, as well as in the liver, spleen, pancreas, peritoneum, and retro-peritoneal glands.

On *microscopical examination* the growth was seen to be a sarcoma with an abnormal amount of fibrous tissue in it.

CASE XIX.—*Medullary Carcinoma of the Right Lung.*

Benjamin Y., aged 54, outdoor labourer.

*Duration of illness.*—Was admitted into Hospital at the end of August, and had been ailing since an attack of influenza the preceding Christmas. Was in Hospital no less than ninety-one days before death, so that he was ill altogether eleven months.

*Symptoms.*—Constant cough, which was an exaggeration of an annual winter cough which he had had for three years. The cough was troublesome, and the sputum was in considerable quantity. Great dyspnœa. Night sweats. During his stay in Hospital was aspirated, and 60 oz. of fluid were removed from his chest.

*Physical signs* were those of chronic phthisis, chiefly of right apex.

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*Post-mortem examination.*—The lower half of the right lung, or even more, was entirely occupied by a new growth, which near the root of the lung became a solid mass about the size of two fists. The growth was very soft, and presented the appearance of a medullary cancer, as it could almost be broken down by a stream of water. The stroma was very scanty. There was old tubercular disease of the apex of the right lung, and to a less extent of left lung.

On *microscopic examination* the growth proved to be a medullary carcinoma.

*Analysis of Preceding Cases.*

| Name. | Age. | Sex. | Duration. | Tumour. | Primary or Secondary. | Commencement. |
|---|---|---|---|---|---|---|
| 1. M. A. S. | 55 | F. | 8 months. | Sarcoma. | Primary. | Ant. mediastinum extending to right lung. |
| 2. W. C. | 42 | M. | 9 months. | Do. | Do. | Do. |
| 3. A. B. | 24 | F. | 11 months. | Do. | Do. | Do. |
| 4. M. S. | 21 | M. | 8 weeks. | Scirrhous carcinoma. | Secondary. | Œsophagus & then in chest. |
| 5. S. S. | 78 | M. | Doubtful. | Encephaloid carcinoma. | Do. | Primary in stomach, secondary in liver and right lung. |
| 6. J. D. | 48 | M. | 4 months. | ... | ... | ... |
| 7. W. B. | 42 | M. | 6 months. | ... | ... | ... |
| 8. M. M. | 31 | F. | 3½ months. | Sarcoma. | Primary. | Anterior mediastinum extending into left lung. |
| 9. G. P. | 50 | M. | 7 months. | Do. | Do. | Do. |
| 10. J. L. | 68 | M. | 6 months. | Encephaloid carcinoma. | Do. | Left side affected. |
| 11. C. G. | 12 | F. | 3½ months. | Sarcoma. | Do. | Probably in mediastinum and extended into left lung |
| 12. A. B. | 43 | F. | +4 months. | Do. | Secondary. | The pancreas. |
| 13. W. F. | 53 | M. | 4 months. | Do. | Primary. | Right lung. |
| 14. A. P. | 37 | M. | 7½ months. | Do. | Do. | Anterior mediastinum to right lung. |
| 15. M. A. T. | 62 | F. | ? | Do. | Do. | Anterior mediastinum and left lung. |
| 16. F. A. | 45 | M. | 4½ months. | Do. | Do. | Do. |
| 17. H. H. | 36 | M. | 3¾ months. | Do. | Do. | Left lung. |
| 18. M. A. K. | 48 | F. | 5 months. | Do. | Do. | Do. |
| 19. B. Y. | 54 | M. | 11 months. | Encephaloid. | Do. | Right lung. |

Of the other cases, four were discharged from the Hospital

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before death, and the notes of five were too incomplete to be employed for the purpose of this paper.

*Pathological anatomy.*—As regards the *kind* of growth, of the seventeen cases the post-mortem notes of which appear in the above description, thirteen are cases of sarcoma, and the microscopical appearances in all cases were very much alike. The tumours were for the most part made up of small round cells and a varying amount of fibrous connective tissue; and of the four cases of carcinoma, three were of the soft or encephaloid variety, and one only of the hard or scirrhous kind. Thus there appears to be an abnormal prevalence of sarcomata, which does not quite agree with the observations of preceding writers; but there seems to be great reason for thinking that many of the tumours in the past recorded as soft carcinomata were in reality, as was pointed out by Hertz, sarcomata. In not a single instance did the disseminated cancer described by Sir Risdon Bennett, "having more or less analogy to disseminated tubercle," appear at the autopsy. Growths other than malignant were never found. The *size* of the tumours was in the great majority of cases very large. Nearly all the cases were *primary*, as opposed to secondary growths, viz., thirteen or fourteen out of seventeen. Of the fourteen, the right *side* was chiefly or only affected in six cases, and the left in eight cases. In ten of the cases the growth appeared to originate in the anterior mediastinum, and to extend thence to the right or left lung. It is very difficult to say in what tissue the growths first took *origin*, whether in the glands of the mediastinum or neck, or in the peri-tracheal and peri-bronchial glands, or in the connective tissue, but the probabilities are in favour of the origin in some glandular structure. No reason can be suggested for the spread in one case into the lower, and in another case into the upper lobe of the lung; but as regards the *direction of the spread*, we may suppose that the new growth in one case began in the glands or tissues nearer one lung than the other, and so passed into that lung with which it had the nearest connection. Pressure upon the heart and implication of the pericardium were marked in several cases; in two or three this was accompanied with severe pericarditis, and in one case, at least, the primary cause of death might be put down to that complication. Pressure and obstruction to the veins within the thorax were observed in several instances, and the accompanying dilatation of the superficial veins of the neck, chest, and abdomen was particularly well marked in Case VI. The nerves (vagus and recurrent laryngeal) were in several instances involved in the tumour. In no case was the sternum or ribs

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involved in the growth. In the cases in which it was possible to obtain really reliable data as to the *duration* of the affection, viz., in seventeen out of nineteen, the average duration was about six months.

*Diagnosis and symptoms.*—It has been over and over again said that the diagnosis of intra-thoracic growths is very difficult, and in the case of a small growth well-nigh impossible. It is a criticism upon this dictum that in few cases is an intra-thoracic tumour, which comes to be investigated at the post-mortem table, undiagnosed during life; at any rate, this may be said about the above cases. No doubt, however, the cases do not present themselves at hospitals until the growth has reached considerable proportions. In some early cases it is not difficult to make out that there is a growth within the chest, but the diagnosis depends, it would seem, more upon the physical signs than upon the symptoms of the affection.

The *symptoms* usually relied upon in the diagnosis are the following:—

*Difficulty in breathing.*—At first it may be only noticed on great exertion, but later on becoming constant and distressing, the inspiration being in some instances accompanied by a noisy or piping sound. This difficulty in breathing to a greater or lesser extent was present in all the cases of which the notes have been given.

*Pain* of some kind, increased on exertion, and often increased on pressure, is a sign of considerable import when present, but was a marked symptom in but a few of our cases; never was it so severe as in certain cases of aneurysm of the aorta. In no case was it noticed that the pain was either constant or distributed over the body generally. In one case there was a complaint of pain in the left shoulder, the growth appearing on post-mortem examination as having affected the apex, or rather the upper lobe of the left lung.

*Cough* was present in the majority of cases, if not in every case, being often of a spasmodic and distressing kind.

*Sputum* of some kind or another was also always present, but it was only in the minority of cases that the frothy or muco-purulent expectoration was tinged with blood. In two or more cases there was a distinct history of *hæmoptysis* of more or less severity, but in no case was there so great a hæmorrhage as to produce death, as in Dr. Church's case, or to produce any marked temporary collapse. If reliance had been placed upon the presence or absence of blood-stained expectoration as a diagnostic symptom of growth within the chest, the diagnosis would have been often wrong.

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*Alteration in the voice* is looked upon as a very important symptom of the intra-thoracic growth. In one case at least it was remarkable for its whispering character (Case IX.); it is sometimes, but not so often as in the case of aneurysms within the chest, harsh, coarse, or stridulous.

*Headache, vertigo, tinnitus aurium, pains in the throat,* and *dysphagia,* were by no means common symptoms, and in the whole of the cases there are only two in which the difficulty of swallowing was at all severe.

*Emaciation,* gradually increasing, was noticed as a symptom in the majority of cases.

*Enlarged veins* of neck, chest, and abdomen, with cyanosis. More or less œdema of the parts as a consequence was marked in five cases, viz., in Cases I., II., VI., VIII., and XIV. It was extreme in two cases, viz., in VI. and XIV.

*Inequality of the pulses,* indicating some change in the great arteries near the heart, was a rare symptom. So also was the possible *alteration of one pupil,* which is occasionally observed.

*The appearance of tumours elsewhere* was an aid to diagnosis in several cases, and in one a sarcomatous tumour was actually removed, and in a second the tumour of the lung was exposed by the operation of incising the chest and keeping it open for the discharge of pus.

*Physical signs.*—The physical signs observed in the chest were singularly simple:—

*Bulging of the side* of the chest or of certain intercostal spaces was a prominent sign in only two cases (III. and X.); *fulness* above one or other clavicle was noticed in one or two cases. The sternum was pushed forwards in not a single case.

*Impaired movement* of the affected side was a very constant sign. *Vocal fremitus was diminished or lost* in nearly every case, but the most constant of all the signs was the *absolute and resisting dulness.* This was *irregular in size and shape,* merging into the præcordial dulness, and change of position was never noted as having produced alteration in the shape of the dull area.

*Vocal resonance was diminished or lost* in the majority of cases, and the reverse, viz., increased vocal resonance, was never recorded.

The character of the breathing was usually much altered over the dull area; in some cases *harsh vesicular breathing,* in other cases *bronchial breathing, cavernous breathing,* or *absent breath sounds* being noticed.

*Onset.*—In more than one case the apparent onset of the disease commenced in a sharp attack of fever accompanied with pain in one side and difficulty of breathing, indicating pleurisy,

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but in most of the cases the onset was very insidious, and although the course was always from bad to worse, the symptoms and signs were those of a chronic nature. In two or three cases, however, there was continued fever and occasional night-sweats. Such cases as these are those most difficult to diagnose from phthisis pulmonalis, and Sir Risdon Bennett and others have drawn particular attention to them; but our experience does not bear out the statement that the *temperature* in the cases in which night or sleep sweats occur is lowered and not raised. The continued fever, night-sweats, and wasting in both classes of cases are no doubt due to the same cause, breaking down of the lung tissue and production of pus, even if there is not, as is often the case, a certain amount of septic absorption at the same time.

*Complications.*—The most common complication was *pleurisy with effusion*, this having been noticed in several cases. In several, tapping of the chest was done in the course of treatment. *Gangrene* of the lung occurred in two cases. *Pericarditis* with blood-stained effusion was present in two cases. *Obliteration of veins* and *arteries* was noted in two or more cases. *Acute pneumonia* in three cases.

*General remarks as regards the diagnosis of intra-thoracic growths.*—Among the conditions which are most likely to cause difficulty in the diagnosis of mediastinal tumours and intra-thoracic growths are the following:—*Aneurysms of the aorta, mediastinal abscess, pericardial effusion, tubercle of the lung*, and *pleurisy with effusion* or *chronic pleurisy with great thickening of* the chest-walls. These conditions must now be considered *seriatim.*

As in other affections into the diagnosis of which much difficulty enters, it is true that very often in a doubtful case all of our diagnostic criteria may be at fault. Bennett goes a step further in his general disbelief in laying down rules for the purpose of distinguishing intra-thoracic growths from other affections within the chest by aid of the physical signs only. He says, "All attempts to lay down precise rules for the differential diagnosis of intra-thoracic growths based upon the physical signs alone, is, it appears to me, little more than waste of time. Of what avail can it be to discuss the differential diagnosis between pleurisy with effusion and a cancerous lung, when, on the one hand, the latter may have occasioned copious effusion into the pleura, and, on the other hand, the former may be complicated by the existence of old adhesions and more or less consolidation of lung from tuberculous or other chronic disease?"

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At the same time it may be as well to mention briefly some of the aids to a correct diagnosis, while bearing in mind that these aids are not infallible.

(*a.*) *From aortic aneurysms.*—If of the ascending arch, there should be almost invariably pulsation; less irregular areas of dulness; less resistance to percussion over dull area; the apex may not be displaced, but the heart sounds should be heard with greater distinctness. There is likely to be a cardiac murmur or accentuation of the second sound. There is more likelihood of inequality of the pulses in the radial arteries, and also more likelihood of implication of the recurrent laryngeal and sympathetic nerves, as evidenced by laryngeal stridor and cough, and inequality of the pupils. Most of these signs, however, fail us when in a mediastinal tumour we have pressure upon veins, causing swelling of the superficial veins of the chest and œdema of the chest-walls, as well as implication of the arteries, both of which occur perhaps as often in the case of aneurysm as of other intra-thoracic tumour. When the veins are obstructed with the growth, it constantly happens that the nerves are affected, and so we have more of our helps to diagnosis taken from us. In certain cases it is next to impossible to distinguish the two affections.

(*b.*) *From abscess of the mediastinum.*—This affection is so uncommon that it is scarcely worth while to do more than mention those symptoms which are cited by the best authorities as likely to distinguish between the two affections. In mediastinal abscess there are feelings of constriction and pressure, with dull boring pain behind the sternum, palpitation, laryngeal irritation, nausea, cyanosis of the face, headache, vertigo, dulness on percussion, bulging of the intercostal spaces, loss of respiratory sounds, &c.; and the diagnosis must depend upon the history, the affection having been produced by injury, *e.g.*, a blow, bullet, dagger or lance point, or to disease of sternum or ribs, purulent collections in the neighbourhood, or possibly metastatic or rheumatic inflammation. There is greater pain, considerable fever, and occasional rigors; a tendency of the abscess to point, and it is stated by one observer that the area of dulness may alter in shape on alteration of the position of the patient.

(*c.*) *From pericardial effusion.*—In pericardial effusion the area of dulness is characteristic in shape, viz., triangular, with the base downwards. There is fever, and generally an absence of chronic pressure symptoms. It should be recollected, however, that pericarditis is a not infrequent accompaniment of mediastinal growth; in which case the characteristic friction

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sound preceding the increased pericardial dulness may often have been detected.

(*d.*) *From tubercle and other affections producing consolidation of the lung.*—Often it is exceedingly difficult to distinguish the two conditions, but the history, gradual increase of the physical signs, the dulness so often beginning at the apex, and hardly ever extending across the middle line of the chest, and above all, the presence of tubercle bacilli in the sputum, will all aid the diagnosis. A considerable help arises in the fact that the dulness in the case of phthisis is never so resisting as in the case of intra-thoracic growths. It must be recollected, however, that the two affections may occur in the same lung, as was the case with several of the cases above described. Under such circumstances there would be tubercle bacilli in the sputum, and the diagnosis would be all the more difficult.

(*e.*) *From pleurisy with effusion, or with great thickening of the chest-walls.*—Of all other conditions, we are inclined to think that the diagnosis of pleurisy from morbid growth is about the most difficult of all. It may be that the position of the dulness is different, but in pleural effusions one has the resisting dulness which may extend across the middle line, accompanied by absence of vocal fremitus and resonance. In general, however, a large effusion is accompanied by much more pushing of the heart's apex-beat to the opposite side; there is fever and a dry cough together, it may be with a severe pain in one side at the onset of the affection. It should be remembered, however, that several of the cases recorded above commenced in the same way, and also that growths within the chest are very often complicated with the pleural effusion. From chronic pleurisy with general and considerable thickening of the chest-wall, there are no sure differences which can be mentioned, and reliance must be placed upon the history of the case, the possible shrinking of the affected side, and the possible pulling over of the heart towards the affected side, or towards the sound side. Chronic pleuritics, however, seldom have blood-stained sputum, and live for many years, suffering pain only on change of the weather or on some special disturbance of the system. There are very rarely any pressure effects in such cases.

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# AN ANALYSIS OF

# TWENTY-EIGHT CASES OF INTUSSUSCEPTION.

BY

W. M^c^ADAM ECCLES.

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The following review of the cases of intussusception which have been admitted into the Hospital during the years 1871–1890 inclusive, yields some points which seem of sufficient interest to entitle them to form the substance of a short paper.

In the twenty years taken, 28 cases have been classified under the head of intussusception; and of these, 25 have been treated during the decade 1881–1890, which fact is in itself an important one, implying either that cases of intussusception have been more readily diagnosed and sent to the Hospital, or that the disease has increased in frequency.

Moreover, this makes the larger number of the cases treated to be within the days of asepsis in surgery.

I have to thank those physicians and surgeons of the Hospital staff under whose care the cases have been for their kindness in allowing me the use of the notes, and helping me in many points.

A full table of the cases, with references to the notes, will be found at the end of the paper.

I purpose to give a detailed analysis of the cases, and under each heading to deduct the more particular inferences to be derived from the facts recorded.

1. *Sex of the patients.*—Of the 28 cases, 17 occurred in males, and 11 occurred in females. This is in accordance with the acknowledged fact that intussusception occurs with greater frequency in males than females.

2. *Age of the patients.*—This is an extremely interesting and important detail, showing that intussusception is a disease



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which especially attacks young children, and that for the greater part under twelve months of age, for in the number of cases tabulated no less than 18 occurred in children less than a year old. Of the remaining ten, four were under two years of age and three under five years, while one was seven years old, another nine, and the last thirty-nine, this being the oldest patient, the youngest being a girl aged three days.

3. *Causes of the affection.*—Of these no definite statement can be made, for the notes are very wanting in reference to this particular; but there is a marked absence of any history of previous gastric or intestinal trouble. The patients are usually stated to have been in good health up to the time the symptoms came on, and that these in most of the cases appeared suddenly. One case presented a small sessile growth at spot of invagination.

4. *Day of the disease on admission, and mortality.* — The length of time which had elapsed since the oncoming of the urgent symptoms is given in the larger number of the cases.

In connection with this point it is interesting to note that the proportion of recoveries decreases rapidly with the increasing length of time from the commencement of the disease.

On the *first* day, only one case was admitted, and this recovered.

On the *second* day, six cases were admitted: only two died, and four lived.

On the *third* day, eight cases were admitted, of whom six died, and only two recovered.

On the *fourth* day, six cases were admitted, and of these not one survived.

On the *fifth* day, one case was taken in, an adult, who died.

Of the remainder, one case was admitted on the *fourteenth* day, and recovered, being a very exceptional case, the only one of its kind among the twenty-eight (No. 8 in the Table).

Four cases were admitted in which the day of the disease was doubtful; and of these, three died, and the one which recovered may probably not have been a case of intussusception at all.

5. *Symptoms and signs.*

(i.) *Symptoms.*—Eleven cases presented the three cardinal symptoms of abdominal pain, vomiting, and the passage of blood and mucus per rectum. Eight cases had two of these symptoms, namely, vomiting and the passage of blood-stained mucus per rectum. Three cases had but one of the three cardinal symptoms, passage of blood with mucus.

It will thus be seen that no less than 22 of the 28 cases presented this last most characteristic symptom.

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Of the remaining six cases, three had symptoms of absolute constipation, and in two of these the intussusception was not diagnosed till after death, one having also a cause of intestinal obstruction beyond the intussusception; in the third case there was no post-mortem examination, so that it may be considered as somewhat doubtful that it was a true case of intussusception.

The last three cases have either no notes or imperfect ones.

(ii.) *Signs.*—The most important sign of the disease is the occurrence of a definite tumour, caused by the intussuscepted bowel and its sheath, which can be felt through the abdominal walls, per rectum, or in both regions.

This, if felt, and associated with the above-mentioned cardinal symptoms, makes the diagnosis of intussusception practically certain. With regard to this particular the cases give the following:—

Eight cases presented a tumour which could be distinctly felt through the abdominal walls, and projected into the rectum, and was reached by the examining finger.

In seven cases the intussusceptum was easily made out per rectum, but could not be palpated through the abdominal walls.

In three other cases it could be felt in the abdomen, but not in the rectum.

Thus, in 18 cases out of the 28, a tumour is stated to have been discovered.

Of the other ten cases, three are said to have presented no swelling, and of seven the notes either do not state whether a tumour could or could not be felt, or they are wanting.

6. *Treatment.*—The treatment of cases of intussusception lends itself to division into three chief heads, which will be dealt with separately.

(i.) That of leaving the patient without any active interference whatsoever; in other words, giving the very slender chance of a satisfactory result by the sloughing of the intussusceptum, and the passage of the gangrenous gut per rectum.

This occurred once in the cases now under consideration, the patient being a female child of three months old, who was admitted on the fourteenth day of the symptoms with the sloughing bowel protruding at the anus. This was partly removed and partly came away by itself. After the sixteenth day the child made an excellent recovery. The specimen of the gut is preserved in the Museum, No. 2191A, and full details of the case will be found under the reference in the Table.

There is only one other specimen of a similar nature, the preceding one (No. 2190), obtained from a woman aged 48.

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Three other cases were left without operative treatment, and of these two died, and the one which recovered was a very doubtful case of intussusception.

Although recovery by the above means seems to be so extremely rare, yet a recent author (Forest, *American Journal of Obstetrics*, 1886) states that it is almost better to leave cases to Nature than to perform laparotomy after failure to reduce by injection or inflation. This advice would seem not to be borne out by facts during the last few years.

(ii.) That of attempting to reduce the gut by means of the distension of the bowel below the intussusceptum either with liquid or gas, helped by manipulation through the abdominal walls. This treatment employed alone was successful in five out of the nine cases of recovery in the 28 cases. On looking into these cases, it will be found that they were all treated with injection of liquid only; not a single case treated with inflation alone, or inflation followed by injection, recovered.

Moreover, they all were early cases, the duration of the symptoms in one case being three days, in three others two days, and in the last only nine hours. The ages of the five children respectively were four, nine, seventeen, eighteen, and eighteen months.

The liquid used for the injection varied. In one it was oil, in one milk, in another water, and in the other two the notes are not explicit as to the nature of the fluid used, but probably it was water.

The number of times the injection was made is of interest. In the *first* case (No. 3 in the Table), eight ounces of fluid (? water) were used, which reduced the tumour, but it speedily reappeared; the injection was therefore again given, and repeated every hour for nine hours, after which there was no return of the symptoms.

In the *second* case an injection of oil was given without an anæsthetic, in consequence of which only two ounces could be introduced, and that without any influence on the intussusception. Under chloroform half a pint of oil was thrown up, which was eminently satisfactory in its results.

In the *third* case a pint of warm milk, injected per rectum, caused complete reduction of the tumour, but it reappeared with all the symptoms on the day after, when a similar injection produced a good and lasting result.

In the *fourth* case the nature of the fluid, and the number of times injection was employed, are not given in the notes.

In the *fifth* case two pints of warm water injected once proved successful.

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Of the fatal cases, four in number, in which injection alone was used, all were cases of longer standing than the ones of recovery given above, except one, an infant of four months, who had had the symptoms for three days. The other three were admitted on the fourth, eighth, and fourth days respectively. The ages of the children were four, four, seven, and four months.

In the *first* case, fluid was injected in all four times, and after the last injection the tumour felt per rectum passed out of reach of the finger, but on post-mortem examination was found not to have been reduced entirely.

In the *second* case the child died from inspiring its vomit while under the anæsthetic, but at the post-mortem two lacerations of the bowel were found, probably produced during the injection, which had consisted of one and a half pints of water.

In the *third* case fluid was injected twice without any result beyond apparent reduction.

In the *fourth* case oil was injected six times and milk twice, but at the post-mortem the intussusception was found unreduced.

In two cases, after injection alone had failed, laparotomy was immediately performed.

One of these, a child of seven years old, was treated with injection of a pint of warm oil by a tube passed per rectum for 24 inches, but without reducing the intussusception. Laparotomy was then performed, the gut easily reduced, and the patient made an excellent recovery. The patient was admitted on the third day of the symptoms.

In the other case, a male child of five months old was admitted on the third day of the complaint, injections given before admission having twice failed. Laparotomy was at once performed, but the child died, and at the post-mortem four inches of intussusceptum was found still present.

One case, a female infant of eight months, had inflation of the gut with air, but this failed to reduce the tumour. Laparotomy was subsequently performed with a fatal result, which will be noticed again below.

Three cases had inflation performed first, one twice over, two only once, followed in each case by one ineffectual trial of injection of fluid, and all three cases were afterwards submitted to the operation of laparotomy, with a fatal result in each instance.

From the above record the conclusion may be fairly drawn, that, given a case of intussusception of not more than three

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days' standing from the beginning of the symptoms, injection of liquid, whether it be water, milk, or oil, under an anæsthetic, gives a very fair chance of recovery, but that after the third day of the symptoms it is of but little use.

The distension of the gut with air gave not a single case with a successful termination.

(iii.) That of performing abdominal section, and reducing the intussusceptum or removing it, and suturing the ends of the resected bowel together, or of opening the gut after stitching it to the abdominal wall above the obstruction.

*Laparotomy* alone was performed in seven cases. Of these, only one was followed by recovery.

The successful case was that of a male infant of nine months old, who was admitted on the second day of the symptoms, and had laparotomy performed within two hours of admission. The gut was quite easily reduced.

Of the fatal cases, the *first* was a case which might fairly be withdrawn from the list, as it was one of a man aged 39, who presented all the symptoms of complete and acute intestinal obstruction, probably of five days' standing. At the operation a knuckle of gut strangulated by an adhesion was found, and the intussusception present as well was not seen till the post-mortem, but was evidently of some days' duration.

The *second* case was a child aged one year and nine months, who, although admitted on the fourth day of the symptoms, was not subjected to operation until the sixth day, no attempt in the meanwhile having been made to reduce the intussusception.

At the laparotomy the gut was easily reduced, but the child died within four hours of the operation, developing a temperature of 106° F. just before death, of the cause of which it might be interesting to speculate.

In the *third* case the laparotomy did not lead to the discovery of the intussusception, and the gut was accordingly stitched to the abdominal wall and opened. Intussusception found at the post-mortem.

In the *fourth* case the notes of details are wanting.

In the *fifth* case the child was very young, being only four months old, and the laparotomy was not performed till the fourth day, the day of admission, when there was some difficulty in reducing the gut.

In the *sixth* and last case, at the post-mortem a small perforation was found in the transverse colon. In this case again there was a high temperature, 105.4° F. before death.

Reviewing the above, it will be seen that of the six fatal cases,

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four were so from causes hardly attributable to death from the operation.

In the first and third cases the intussusception was not discovered at the operation, and if it had been, the result might have been otherwise.

In the second and sixth cases there is the high temperature recorded, and the cause of it, possibly avoidable, may have been partly responsible for the ending; besides, the last case presented the complication of a perforation of the gut.

The fourth case has insufficient notes: this, therefore, leaves us with the fifth case, and perhaps the fourth, in which laparotomy and reduction of the gut unaccompanied by any complication was ineffectual in producing a successful result.

Six other cases were operated upon after an attempt or attempts had been made by injection or inflation, or both, to reduce the gut.

Of these six, only one made a recovery. It was that of a female child aged seven years, and therefore a good deal older than the majority of the cases, who was admitted on the third day of the disease, and after one ineffectual attempt at reduction by injection of warm oil, was subjected to laparotomy, with easy reduction of the gut, and complete recovery afterwards.

Of the unsuccessful cases, the *first* was a case in which the ileum at its lower end had slipped through the ileo-cæcal valve and had become gangrenous; the valve at the operation was slit up, and the dead portion of ileum removed and the ends of the gut sutured, but the child, aged eight months, died five hours after the operation.

In the *second* case, although it was only the third day of the symptoms, peritonitis was found at the time of the operation, a condition which will be seen on reference to the Table was rarely present, and it caused much difficulty in reducing the gut.

In the *third* case the operation was quite successful, and since the disease had only lasted for two days, and the child passed motions per rectum for two days after the operation, boded a good result, but the child developed great distension of the abdomen, and the temperature rose to 106.6° F. This case is therefore similar in this respect to two mentioned in the last set of cases.

The *fourth* case again was one in which peritonitis was present at the time of the operation, although symptoms had lasted only three days, and the gut could not be reduced owing to the firm adherence of the entering and returning layers of the intussusceptum.

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The *fifth* case was probably one where there was only partial reduction of the invaginated gut at the time of the operation, or of its speedy re-invagination after it. The child only survived two hours.

Again reviewing this series of cases, it will be seen that in all death was due in great measure to conditions entirely apart from the operation itself; thus in the second and fourth cases peritonitis causing difficulty and failure in the reduction of the gut, and in the first there was quite an unusual condition of affairs, while the third and last had probably avoidable causes to account for their termination in a fatal manner.

Altogether, then, thirteen cases had abdominal section performed, with the result that only two recovered and eleven died; but only two of these latter, and possibly only one, were cases in which the operation, although apparently quite successful, was followed by a fatal termination.

Again, notice must be taken that there were five cases of recovery from injection of liquid, as against only two from laparotomy; one of these latter, however, being after there had been failure of reduction by injection. Briefly, the treatment employed and its result in the twenty-eight cases was the following:—

I. *Four* cases were left without any active operative treatment, and of these *two* recovered and *two* died.

II. (*a.*) *One* had inflation performed, with subsequent laparotomy and death.

(*b.*) *Nine* had injection only, with *five* recoveries and *four* deaths.

(*c.*) *Three* had both inflation and injection, followed in each case by laparotomy with a fatal result.

(*d.*) *Three* had injection only, with laparotomy afterwards, *one* recovering and *two* dying.

III. *Six* had laparotomy only performed, of whom *one* lived and *five* succumbed.

Of the remaining two cases, one is without notes and the other was operated on under the belief that the symptoms were due to an inguinal hernia, and there was a fatal result in both cases.

From the above analysis it would seem that for the successful treatment of cases of intussusception, *early diagnosis* of the disease is of the utmost importance, and that any child presenting one or both of the two most important signs or symptoms, namely, the passage of blood-stained mucus per rectum, and the presence of a tumour felt per abdomen or per rectum, should at once be treated as if it were a case of intussuscepted gut.

The line of treatment, moreover, would seem to be one fair

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trial of injection of liquid in cases presenting a definite tumour, followed by immediate laparotomy if it is unsuccessful, or laparotomy at once in cases where there is any doubt as to the presence of invagination of the bowel.

The greatest possible care is indicated in preventing shock to the usually very young patient, both during the trial of injection and the subsequent laparotomy, if that be performed.

The least unnecessary exposure of the legs or trunk during the manipulations may just be the turning-point towards a fatal issue of the case where otherwise success would have been obtained. The future of the treatment of cases of intussusception may be another instance in the present great advance of diagnosis and prompt treatment of intestinal obstruction in its various forms, and it may be confidently hoped that within a few years many more of these young children may be saved from death, among whom now the condition of an invaginated bowel plays so much havoc.

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*Table of Cases of Intussusception Admitted during the Years 1871–1890 inclusive.*

| No. of Case. | Year. | Physician or Surgeon. | Sex. | Age. | Day of Disease on Admission. | Symptoms. | Treatment. | Result. | Remarks. | Reference. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1873 | ... | F. | Under 5 years. | ? | ... | ... | Death. | No further notes can be found. | |
| 2 | 1877 | Mr. Smith. | M. | 8 mos. | 4 | Abdominal pain. Vomiting. Some blood passed per rectum. No tumour felt either per abdomen or per rectum. | *Inflation* on 2nd day. Slight relief. *Inflation* on 3rd day. *Injection* of warm water on 4th day, with much relief. *Laparotomy* on 5th day. | Death, five hours after operation. | There was no peritonitis, although the ileum, which had slipped through the ileo-cæcal valve, was gangrenous. The valve was slit up and dead portion of gut removed. Ends of intestine united. | Lucas, iv. 353. |
| 3 | 1880 | Dr. Andrew. | M. | 4 mos. | 2 | Abdominal pain. Vomiting. Blood and mucus per rectum. Tumour felt per abdomen and per rectum. | *Injection* of 8 oz. of fluid, reducing the tumour. It reappeared again. *Injection* again given and repeated every hour for nine hours. | Recovery. | An early case, in which careful and continued injections brought about a cure. | Hope, viii. 441. |
| 4 | 1881 | Dr. Andrew. | M. | 4 mos. | 3 | Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per rectum. | *Injections* repeated four times. Bowel went up out of reach after the last one. | Death, the day after admission. | P.M. no peritonitis. The intussusceptum passed upwards as well as downwards. | Hope, ix. 59. |
| 5 | 1882 | Mr. Walsham. | M. | 7 mos. | 3 | Abdominal pain. Vomiting. Blood and mucus per rectum. Tumour felt per abdomen and per rectum. | *Inflation* with air, then *Injection* of water; proved ineffectual. *Laparotomy* on third day of disease. | Death four hours after operation. | There was peritonitis at the time of the operation. Much difficulty in reducing the gut. P.M. there was a complete mesocolon 2½ to 3 inches in length. | President, viii. 438. |

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| 6 | 1882 | Mr. Marsh. | F. | 8 mos. | 2 | Abdominal pain. Vomiting. Blood and mucus per rectum. Tumour felt per abdomen and per rectum. Great collapse. | *Inflation* with air tried unsuccessfully. *Laparotomy* on second day of disease. | Death two days after operation. | There was no peritonitis at time of operation, and gut was easily reduced. Two blood-stained motions passed after. Abdomen became greatly distended before death, and temperature rose to 106.6° F. | Lucas, viii. 24. |
| 7 | 1882 | Dr. Gee. Mr. Cripps. | M. | 39 yrs. | ? 5 | Abdominal pain. Vomiting; becoming stercoraceous. Constipation absolute. | *Laparotomy;* a knuckle of intestine strangulated by adhesions found. | Death, three hours after operation. | P.M. peritonitis well marked. There was an intussusceptum of some standing near the ileo-cæcal valve. In this case there were two causes of intestinal obstruction. | Colston, viii. 253. Luke, 601. |
| 8 | 1882 | Mr. Cripps. | F. | 3 mos. | 14 | Abdominal pain. Vomiting. Passage of "black stuff" per rectum, with "pieces of flesh." Protrusion of gut per rectum. | Partial removal of gangrenous protruding portion. The rest came away spontaneously. | Recovery. | An example of that rare condition, a cure by separation of gangrenous gut. Symptoms lasted 16 days. | Sitwell, vii. 351. |
| 9 | 1883 | Mr. Langton. | F. | 17 mos. | 3 | Blood and mucus per rectum. No vomiting. Tumour felt per rectum. | *Injection* of oil. Without anæsthetic, 2 oz. only. With chloroform, half a pint. | Recovery. | An early case. Tumour disappeared entirely after injection, and the child recovered perfectly. | Sitwell, viii. 163. |
| 10 | 1883 | Mr. Baker. | F. | 3 days. | ? | Blood and mucus per rectum. "All the signs of obstruction of the bowels." Great collapse. | Child too ill on admission to warrant operative measures. | Death day after admission. | No P.M. A very young patient. | Sitwell, viii. 228. |

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*Table of Cases of Intussusception—(continued).*

| No. of Case. | Year. | Physician or Surgeon. | Sex. | Age. | Day of Disease on Admission. | Symptoms. | Treatment. | Result. | Remarks. | Reference. |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 1884 | Dr. Andrew. Mr. Marsh. | F. | 1 year 9 mos. | 4 | Vomiting. Blood-stained motions. Tumour felt per abdomen. | No attempt at reduction. *Laparotomy*, on the sixth day. | Death, four hours after operation. | Intussusception easily reduced. No peritonitis. Temperature rose to 106° F. just before death. | Mr. Marsh, 623. |
| 12 | 1884 | Sir William Savory. | F. | 1 year 6 mos. | 1 | Vomiting. Blood and mucus per rectum. Tumour felt per abdomen. | *Injection* of a pint of warm milk. Reduction, and then reappearance next day. *Injection* repeated. Reduction. | Recovery. | A case which was diagnosed and treated on the first day symptoms were present. Injection performed within nine hours of commencement. | Sir William Savory, 1961. |
| 13 | 1884 | Mr. Cripps. | M. | 4 mos. | 4 | Vomiting. Blood and mucus per rectum. Tumour felt per rectum. | *Injection* of one and a half pints of water. | Death, during injection. | The child vomited, and inspired the vomit during the injection. P.M. there were two lacerations of the bowels, probably caused by injection. | Mr. Cripps, 1011. |
| 14 | 1884 | Mr. Baker. | M. | 7 mos. | 8 | Blood and mucus per rectum. No tumour felt per abdomen, but one felt per rectum. | *Injection* twice performed. | Death, five hours after last injection. | The gut was apparently reduced by the second injection. No P.M. notes. | Mr. Baker, 1008. |
| 15 | 1885 | Mr. Cripps. | F. | 9 years. | 4 | Pain in the abdomen. Vomiting. Dark coloured motion. | Enema given on admission. *Laparotomy* on fifth day. Enterotomy. | Death, the day after operation. | Child older than most of the cases. Intussusception only found at P.M. Ileum had passed through the ileo-cæcal valve and was gangrenous. There was no peritonitis. | Mr. Cripps, 1975. |

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|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 1886 | Dr. Andrew. | M. | 4 mos. | ? 4 | Vomiting. Blood and mucus per rectum. No tumour per abdomen, but one felt per rectum. | *Injections* of oil six times. *Injections* of milk twice. | Death. | Tumour disappeared from rectum, but symptoms continued. Child died before laparotomy could be done. P.M. some local peritonitis. Gut partially reduced by injections. | Hope, 47. |
| 17 | 1888 | Mr. Walsham. | M. | 8 mos. | ? | No notes. | *Laparotomy.* Gut reduced. | Death day after operation. | P.M. a small sessile growth at the place where intussusception commenced. | Mr. Walsham, 1325. |
| 18 | 1888 | Mr. Cripps. | M. | 10 wks. | 2 | Had a swelling in the right scrotal region, thought to be a hernia. | Swelling explored. No hernia. | Death, two days after admission. | P.M. no peritonitis. No adherence of intussusception, which was found at P.M. | Mr. Cripps, 2586. |
| 19 | 1888 | Mr. Marsh. | F. | 7 mos. | 3 | Abdominal pain. Vomiting. Absolute constipation. | No operative treatment. | Death day after admission. | P.M. an intussusception found. Gut gangrenous, and adherent. No peritonitis. | Mr. Marsh, 2161. |
| 20 | 1888 | Mr. Bruce Clarke. | F. | 4 years 6 mos. | ? | Blood and mucus per rectum. No vomiting. No tumour felt. | No operative treatment. | Recovery. | A doubtful case. Possibly enteritis only. | Mr. Bruce Clarke, 1659. |
| 21 | 1889 | Mr. Marsh. | M. | 4 mos. | 4 | Abdominal pain. Vomiting. Watery motions with blood. Tumour felt in left iliac fossa and per rectum. | *Laparotomy* on fourth day. Some difficulty in reducing the gut. | Death six hours after operation. | P.M. no peritonitis. | Mr. Marsh, 2461. |

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*Table of Cases of Intussusception—(continued).*

| No. of Case. | Year. | Physician or Surgeon. | Sex. | Age. | Day of Disease on Admission. | Symptoms. | Treatment. | Result. | Remarks. | Reference. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 1889 | Mr. Willett. | M. | 18 mos. | 2 | Blood and mucus per rectum. Bowel protruding from anus, 3 or 4 inches. | *Reduced* and passed up out of reach. | Recovery. | An early case.<br>The notes are not explicit as to the means used for reduction. | Mr. Willett, 1932. |
| 23 | 1889 | Mr. Walsham. | M. | 3 yrs. | 3 | Vomiting blood and mucus per rectum.<br>Tumour felt per abdomen and per rectum. | *Injection* of oil.<br>*Inflation* with air, both failed.<br>*Laparotomy.*<br>Gut could not be reduced; a portion of small intestine above stitched to wound and opened. | Death. | No P.M.<br>This was one of those cases where from adherence of entering and returning layer, the intussusceptum could not be reduced. | Mr. Walsham, 3358. |
| 24 | 1889 | Mr. Butlin. | F. | 7 yrs. | 3 | Abdominal pain. Vomiting. Blood-stained mucus per rectum.<br>No tumour to be felt per abdomen or per rectum. | *Injection* by rectal tube passed 24 inches one pint of warm oil.<br>*Laparotomy* on third day.<br>Gut easily reduced. | Recovery. | A fairly early case in a patient whose age was more hopeful.<br>Laparotomy easily performed.<br>Motions per rectum two days after. | Mr. Butlin, 1180. |
| 25 | 1890 | Sir William Savory.<br>Mr. Marsh. | M. | 9 mos. | 2 | Vomiting. Blood passed per rectum.<br>Tumour felt per abdomen. | *Laparotomy* on second day, within two hours of admission.<br>Gut easily reduced. | Recovery. | An early case in a young infant, treated at once, and successfully, by laparotomy.<br>Motions without blood same night. | Mr. Marsh, 1483. |

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|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 1890 | Mr. Walsham. | M. | 9 mos. | 3 | Abdominal pain. Vomiting. Blood and mucus passed per rectum. Tumour felt per abdomen and per rectum. | *Laparotomy* on third day. Fairly easy reduction of gut. | Death, day after operation. | P.M. a small perforation was found in the transverse colon. Temp. rose to 105.4° F. before death. | Mr. Walsham, 412. |
| 27 | 1890 | Mr. Cripps. | M. | 5 mos. | 3 | Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen and per rectum. | *Injections* of warm water failed twice before admission. *Laparotomy* on third day. Gut easily reduced. | Death, two hours after operation. | P.M. no peritonitis. Four inches of intussusception present; ? incomplete reduction. | Mr. Cripps, 2446. |
| 28 | 1890 | Dr. Gee. | M. | 9 mos. | 2 | Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen and per rectum. | *Injection* of warm water, two pints. | Recovery. | An early case, treated very successfully by injection. Bowels open next day without blood. | Mary, 200. |

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# NINE CASES OF INTESTINAL OBSTRUCTION,

## DUE TO VARIOUS CAUSES,

BY

F. W. TUNNICLIFFE,

WITH SOME REMARKS BY MR. BRUCE CLARKE.

*Remarks by Mr. Bruce Clarke.*

The first three of these cases were due to intussusception, and are interesting as showing the occasional value of injection of hot water per anum in effecting reduction of the bowel. The child in question had been ill nine or ten days; the case, therefore, was a very chronic one. In the other two cases this method failed, and both were submitted to laparotomy. In both reduction was effected with some difficulty; one of them made a perfect recovery, the other never recovered the collapse from which it was suffering when brought to the Hospital.

The next two cases were the result of cancerous stricture low down in the bowel, and contrast well in their results. In one, rupture of the gut had taken place, and the peritoneum was filled with fæces. It is not too much to say that had he come for operation a week earlier, a year or two might have been added to his existence.

Following these comes a case of impacted gall-stone in the small intestine, in which no difficulty was experienced in finding the stone; but the patient was so weak before the operation that she failed to recover. Had she taken the advice of her medical man, and submitted to operation earlier, her life might have been saved.

After this follow two cases of umbilical hernia, which contrast both in their treatment and result. In the first case, the usual method of opening the sac was carried out, with the result that between two and three hours elapsed before the



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intestine could be unravelled and the superfluous omentum cut away. On the second occasion the abdomen was opened below the hernial sac, and the sac cut into subsequently, rendering the operation easier of performance, and resulting in an excellent recovery for the patient. The whole operation did not take much more than twenty minutes.

The last of these cases is chiefly remarkable on account of the difficulty in diagnosis, which time alone cleared up. An old hernial sac was first opened and found to contain no strangulated gut or omentum. Subsequently, as the symptoms continued, a consultation was held, at which it was unanimously decided to open the abdomen and search for the cause of obstruction. The patient would not give her consent to this until she had seen her friends. Twenty-four hours later their consent was obtained, by which time all urgent symptoms had disappeared. A few days later she left the Hospital in excellent health, ascribing all her symptoms, probably quite correctly, to an injudicious feast of pork.

CASE I.—*Intussusception—Laparotomy—Intestine reduced, followed by Death a few hours later.*

C. G. H., aged 13 months, was admitted into Rahere Ward under the care of Mr. Bruce Clarke in August 1891, suffering from intestinal obstruction. The child was fat and rickety and not weaned.

*History of present condition.*—Child been ailing for forty-eight hours; last twenty-four hours vomiting more or less constant, with discharge of blood from anus.

*Present condition.*—Child collapsed; pulse 180, thready; face drawn and anxious; temp. 99.5°; abdomen distended and tender. There was an ill-defined sausage-shaped tumour extending from the right iliac fossa upwards and slightly inwards. Percussion note over tumour high pitched, over rest of abdomen tympanitic. Around the anus there was some red blood-stained mucous discharge visible.

The child was without any loss of time taken into the theatre, and Mr. Bruce Clarke performed laparotomy, making an incision in the middle line about two inches in length.

The sausage-shaped tumour was found to consist of an intussusception, the ileum and the ileo-cæcal valve being invaginated into the ascending colon for a distance of some sixteen inches. By gently squeezing the outer part of the colon where the intussuscepted portion of the small intestine lay, it was rapidly reduced without any difficulty. There was no peritonitis pre-

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sent, but a good deal of intestinal distension. The wound was secured in the usual way, and dressed with salalembroth gauze; the time during which the child was under chloroform was not more than ten minutes.

After the operation, the child was a good deal collapsed, and small quantities of milk and egg and brandy were administered both by mouth and per anum, and the child was kept very warmly wrapped up in front of the fire.

It never completely rallied after the operation, and died during the course of the night.

A post-mortem examination was made the following day. The intestine was completely reduced. There was no peritonitis, and the rest of the organs were healthy.

CASE II.—*Intussusception Reduced by Injection of Warm Water.*

A. R. D., aged 5 months, was admitted into Sitwell Ward on February 29, 1892, under the care of Mr. Bruce Clarke, suffering from intussusception.

*History of present condition.*—Nine days ago patient passed blood and slime per anum; this lasted for two days. One day ago passed blood and slime again, vomited, and passed no fæces. Bowels open last two days ago.

*Present condition.*—Child seems ill; an elongated tumour felt in region of descending colon. Some bowel protruding at anus. Protruded bowel was temporarily replaced. Later Mr. Bruce Clarke again replaced the bowel and injected the rectum with warm water. The tumour in the left lumbar region was immediately reduced.

Soon after the operation vomiting ceased, the child was able to take the breast, and passed no more blood-stained slime. Bowels open naturally.

No further tendency to intussusception was exhibited, and in a few days the child left the Hospital perfectly well.

CASE III.—*Intussusception—Laparotomy—Recovery.*[1]

A. H. D., aged 6 months, was admitted into Lucas Ward under the care of Mr. Bruce Clarke on September 7, 1892, with symptoms pointing to intussusception.

*History of present condition.* — Fourteen hours ago, commencement of abdominal pain, which continued during the night; four hours ago passed blood and slime per rectum and had attack of vomiting; purge given.

[1] For these notes I am indebted to Mr. Dyall.

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*Present condition.*—In the surgery, vomiting; blood and mucus passed per anum; per rectum intussusception distinctly felt; marked swelling in left iliac fossa.

Hot milk was at once injected, and swelling apparently disappeared.

3.30 P.M., vomiting and reappearance of swelling; 10 P.M., Mr. Bruce Clarke performed abdominal section, the incision extending above umbilicus.

The intussusception was found to extend from ileo-cæcal valve to left kidney. Very considerable difficulty was experienced in reducing the intussusception, which was at last effected, partly by squeezing the large intestine, and partly by pulling on the small. The intussuscepted portion was so firmly contracted, that even when it was reduced, it was difficult to be certain of the fact; and the child was so collapsed that time was a very important element.

Before the abdomen was finally closed, the contracted intestine could be felt to be relaxed, and normal both in feel and situation. Abdomen closed in the usual manner.

As soon as the child came round from the anæsthetic, it was very restless, and tiny doses of opium were given at intervals of a few hours to keep it quiet, accompanied with small quanties of milk and water by the mouth. No further vomiting occurred.

September 9.—Child passed a motion slightly streaked with blood and containing mucus, but there was no pain or tenesmus accompanying it. Temperature, 99°.

September 14.—Child stronger and more comfortable. The opium was now left off; small doses of brandy, amounting to 30 drops, given.

After this period the child made regular progress towards recovery. A few days later the sutures were removed, and on October 5, 1892, it left the Hospital well.

### Case IV.—*Cancerous Stricture, giving rise to almost Complete Obstruction—Inguinal Colotomy—Recovery.*

J. E., aged 47, admitted into Harley Ward under the care of Mr. Baker, April 6, 1891, suffering from diarrhœa, alternating with occasional attacks of constipation amounting almost to complete obstruction.

*History of present condition.*—Patient had been treated outside for six weeks for diarrhœa. As he was continuing to lose flesh, he came to the medical side of the Hospital. After a rectal examination was made, he was at once admitted. Upon

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questioning, he admitted difficulty of defæcation for two months, and also tertiary syphilis.

*Present condition.*—Patient considerably wasted; complains of constant, inefficacious desire to defæcate.

Upon examination of rectum, a fungating hard-edged growth occupied the antero-lateral wall of rectum. The index finger could just by an effort reach beyond the growth; the surface was depressed and fissured; the mass was fixed.

April 24.—Inguinal colotomy was performed by Mr. Bruce Clarke.

April 27.—Gut was opened.

May 6.—A solid well-formed motion was passed through the wound; the desire to defæcate and the constant muco-purulent discharge from anus soon abated; the pain was greatly diminished.

May 20.—The patient was discharged wearing a pad over his wound. When last heard of, viz., in May 1892, he was still able to get about and was quite comfortable.

CASE V.—*Intestinal Obstruction caused by Cancerous Stricture high up in Rectum—Rupture of Gut—Peritoneum filled with Fæcal Extravasation—Laparotomy—Flushing—Death from Shock.*

D. E., aged 65 years, was admitted into Rahere Ward, February 14, 1892, suffering from acute intestinal obstruction.

*History of present condition.*—The patient has had attacks of constipation for the last year, going seven days without a fæcal evacuation; says that four days ago he passed a small motion; up till twenty-four hours ago, vomiting frequent; has only occurred twice since; no clear description of character of vomit to be obtained. He has remained at home for the last week against advice of medical man, who wished him to come to the Hospital.

*Present condition.*—Patient markedly collapsed. Pulse 160, intermittent, thready. Extremities cold; anxious abdominal face; abdomen greatly distended, dull in the flanks, surface œdematous, veins greatly distended, left iliac fossa tender; general abdominal pain very acute; no vomiting. Although several herniæ were present, there was obviously no strangulation. Examination per rectum gave a negative result as to cause of obstruction, the rectum as far as the finger could reach being quite empty.

The patient was taken to the theatre, and Mr. Bruce Clarke opened the abdomen in the middle line. The peritoneal cavity

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was filled with dark, stinking fæcal matter, which was washed out with warm water. An attempt was then made to find the perforation; this was quickly discovered to be in the upper part of the cæcum, whilst the cancerous annular stricture completely occluding the gut could be felt in the upper part of rectum. At this stage in the operation, which had not lasted more than fifteen minutes, the patient became suddenly collapsed and died almost immediately. The post-mortem examination twenty-four hours later revealed no other lesions than those which had been discovered at the operation.

CASE VI.—*Intestinal Obstruction—Laparotomy—Gall-stone removed from Small Intestine—Death from Exhaustion.*

M. D., aged 75 years, was admitted into Sitwell Ward on February 14, 1892, suffering from acute intestinal obstruction.

*History of present condition.*—Bowels last open seven days ago; vomiting for last four days, very foul smelling during the last twenty-four hours. Called in a medical man, who advised removal to Hospital, but she would not consent until a few hours before admission. Flatus last passed twenty-four hours ago.

*Present condition.*—Patient collapsed; pulse very rapid, thready, intermittent; face drawn; skin slightly yellow; abdomen distended; resonant everywhere to percussion, not tympanitic; no hernia or other tumour to be felt; rectum empty, no stricture to be felt.

Patient was taken into theatre, and Mr. Bruce Clarke opened the abdomen in the middle line. The sigmoid flexure and descending colon were quickly examined, after which the cæcum was palpated, but was found to be flaccid and empty. The lower end of the small intestine was then seized, and the intestine rapidly passed through the fingers. When about six feet of the gut had been traversed, a hard substance was distinctly felt inside its lumen; and about the seat of the obstruction the intestine was markedly distended, contrasting very distinctly with its condition below.

A linear incision was made in the long axis of the gut down on to the foreign body, which was extracted without any difficulty. The edges of the wound were united by means of a double Lembert's suture. The foreign body, which proved to be a gall-stone, was cylindrical in shape, three inches long, with a short diameter of three-quarters of an inch; both ends were faceted. The abdominal wound was closed in the usual manner and dressed with cyanide gauze. On account of the extreme collapse of the patient, it was found necessary to

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commence stimulants very shortly after the operation. She completely recovered consciousness about two hours after the operation, but a semi-comatose condition rapidly supervened, lasting until death, which occurred fourteen hours later. At the post-mortem examination the double Lembert's suture was tested by pouring water into the intestine and endeavouring to make it pass through the suture; it was by this means found that the suture resisted an artificial pressure very much stronger than the one to which it would be exposed by natural causes. The gall-bladder was found full of gall-stones. Her friends were carefully questioned, but no history could be obtained of anything like attacks of obstructive jaundice.

CASE VII.—*Umbilical Hernia of Thirty Years' Standing—Incarceration—Fluid in Sac—Obstruction—Operation for Radical Cure—Death.*

A. K., aged 48 years, was admitted into Harley Ward under the care of Mr. Bruce Clarke on August 4, 1891, suffering from umbilical hernia.

*History of present condition.*—Reducible umbilical hernia for last thirty years; four days ago hernia became irreducible, also a hard lump developed in the tumour; at the same time constipation supervened, which he has treated with purgatives; bowels open with great pain, vomiting for last twenty-four hours, not fæculent.

*Present condition.*—Patient has large umbilical hernia as big as child's head; distinct impulse on coughing; the hernia cannot be reduced; a large irregular mass occupies the left lower part of the tumour, feeling like a lump of fæces. Patient is also the subject of a right irreducible inguinal hernia.

Treatment consisted in keeping patient in bed, a light diet, copious enemata, and large doses of mag. sulph.; this considerably reduced the size of the fæcal mass.

*August* 18.—Patient has paroxysms of acute pain; fæcal lump disappeared, but sac has become very tense and dull to percussion. Sac punctured with trochar and ʒx. of serous fluid removed.

*August* 19.—Sac again very tense; it was again punctured and ʒiv. were withdrawn. The obstruction is not complete, bowels being open every other day; but the motions are very scanty, and only after copious enemata. The abdomen is greatly distended; morphia was to be freely given on account of the acuteness of the pain.

*August* 20.—Mr. Walsham saw the patient in consultation

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with Mr. Bruce Clarke, and it was decided that something must be done, although the case was obviously very unfavourable. The patient was taken into the theatre and Mr. Bruce Clarke proceeded to operate. An incision was made over the tumour in the region of the linea semilunaris and the sac opened. The incision was subsequently enlarged upwards and downwards. The sac contained a portion of the transverse colon, which was engorged but not strangulated, a large mass of omentum, which was united to the sac-wall by high fibrous adhesions, and a considerable quantity of fluid. The adhesions were all carefully dissected off the wall of the sac; the omentum ligatured where it entered the sac. The distal portion was cut off, and the omental stump, together with the intestine, returned through the neck of the sac, after which the neck of the sac was firmly ligatured. The edges of the wound were brought together by stout silk ligatures, and a Keith's drainage-tube, with thin rubber sheeting and sponge, was inserted into the abdomen. The operation lasted rather more than three hours.

The sponge of the drainage-tube was constantly changed during the night, and the tube gently aspirated. A small quantity of blood-stained serum was withdrawn.

The patient never really recovered from the operation, and died about 10 A.M.

The post-mortem examination revealed no condition to account for death, which was doubtless due to shock.

CASE VIII.—*Umbilical Hernia—Incarceration—Abdominal Section—Herniotomy—Reduction of Hernia—Removal of a portion of Omentum, which proved to be Cancerous—Recovery.*

S. J. D., aged 52 years, was admitted into Sitwell Ward on February 23, 1892, under the care of Mr. Bruce Clarke, suffering from an umbilical hernia.

*History of present condition.*—Patient first noticed swelling five years ago; she can give no cause for its first occurrence; has been increasing in size since. For the last two years has been troubled with constipation, amounting at times almost to complete obstruction, which she has treated by the liberal use of domestic purgatives.

*Present condition.*—Upon admission there existed a large irreducible umbilical hernia, dull to percussion, hard and irregularly nodular to touch. No sign of strangulation of intestine present.

*Treatment* consisted in keeping patient at rest in bed on a low diet, and administering purgatives from time to time. This caused considerable diminution in size of tumour, and also in

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its nodular contents; but, nevertheless, it remained irreducible, and one hard fibrous lump remained constant; the tumour also continued very painful.

March 11.—Mr. Bruce Clarke opened the abdomen. This was done by making a vertical incision in the linea alba, commencing immediately below the hernia, and extending into the peritoneal cavity; this incision was prolonged through the sac, and circumferentially round the tumour. The sac was found to be filled with a large mass (the size of a cocoa-nut) of thickened omentum, which was removed, and the stump ligatured piecemeal, and returned. The skin and subcutaneous structures over the tumour, with the sac-wall, were cut away, and the edges of the wound brought together with thick silk ligatures, which included all structures. The wound was dressed in the usual manner.

March 21.—Stitches were removed; from this time on, the patient made a good recovery.

The mass of omentum which was removed was submitted to microscopical examination, and this revealed, what from its section at the time of operation was feared, viz., that it was a cancerous mass; it showed throughout colonies of epithelial cells surrounded by a fibrous tissue network; the cells were very large and contained many nuclei.

Up to the present time the patient continues to be in good health.

CASE IX.—*Hernia—Symptoms of Obstruction—Hernial Sac Opened, with Negative Result—Gradual Recovery—Patient had had heavy meal of pork four days before admission.*

S. M. S., aged 57, was sent to the Hospital March 2, 1892, with a diagnosis of strangulated femoral hernia. This diagnosis, it must be said, was a provisional one, it not being regarded as by any means an ordinary case.

*History of present condition.*—Last three days bowels not open, and constant vomiting. Four days ago had eaten heartily of pork. Flatus passed up to admission. Vomit had smelt offensive, but still statement was not volunteered.

*Present condition.*—Woman looks very ill. Pulse 140, small, intermittent, and thready. Temperature subnormal. Constant vomiting; vomit is not typically fæcal, but is dark-coloured and offensive. Abdomen tender, not distended. Beneath Poupart's ligament on left side was a small inflamed lump, dull on percussion, having no impulse on coughing. Per rectum nothing discovered, except that the rectum was empty.

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As the woman was obviously getting worse, it was considered advisable to explore the lump in the left femoral region; this was done; no hernial sac could be discovered either there or in inguinal region.

March 3.—Vomiting still continues, with great thirst. Bowels not open; patient losing ground.

March 4.—As patient was still getting obviously worse, vomiting after everything administered by the mouth, and even when nothing was given, Mr. Bruce Clarke decided to have a consultation.

The balance of opinion was in favour of laparotomy, although the existence of obstruction seemed doubtful, and, if present, was located high in the intestinal tract. The woman refused her consent until she had spoken with her friends.

Iced champagne was administered in teaspoonfuls.

March 4, 10 P.M.—Patient has not vomited since 2 P.M.

Friends and patient have consented to an operation. Condition of patient certainly improved. No operation, therefore, attempted that night.

March 5.—Condition of patient greatly improved; vomiting ceased, bowels open once. All question of operation given up.

From this time on, the patient continued to progress, and was discharged on March 16, *i.e.*, fourteen days after admission.

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TWO

# CASES OF ABSCESS OF THE GALL-BLADDER,

## AND ONE OF PROTRACTED JAUNDICE.

BY

NORMAN MOORE, M.D.

In the Transactions of the Pathological Society for 1891, I have described a case of ulceration of the gall-bladder, followed by perforation, peritonitis, and death. The patient was a man aged 67 years, and was not jaundiced. No gall-stones were found post-mortem, but the gall-bladder contained much hard bile gravel. Dr. Hawkins of St. Thomas's Hospital has this year shown at the Pathological Society another example of ulceration and perforation of the gall-bladder, in which there was a calculus in the neck, but none near the ulcer, which was at the fundus. The absence of adhesions was the probable cause of the fatal method of termination in these cases.

In both the cases which follow, adhesions to the abdominal wall led to a favourable termination.

### CASE I.—*Abscess of Gall-Bladder.*

Charles F., aged 43 years, a warehouse clerk, was seen by me at his own house, March 13, 1889. He was in bed, with a temperature of 103°, and complained of pain in his abdomen, which was distended. The right hypochondrium projected more than the left, and near the middle line an indistinct edge could be felt, as if dividing the right lobe of the liver from the left. The lower edge could not be felt. I thought that I could perceive a distant fluctuation over the right lobe of the liver. There was no jaundice. On December 20, 1888, the patient had had an attack of vomiting, which lasted three days. He had felt ill from that date, and soon after noticed a lump below the ribs on that side. During January 1889 the lump grew larger, and he

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vomited once. In February he had a shivering fit, followed by sweating, and on March 11 he had three similar attacks. He had grown more and more ill, but only gave up work on March 6. In 1883 he had had some pain and swelling in the right hypochondrium, but after a fortnight's illness recovered. He had been in British North America for nine months in 1864, but had had no dysentery or other illness there.

His heart and lungs were normal. Hepatic dulness did not extend upwards beyond the fifth rib, and the spleen was not to be felt. His tongue was thickly furred; his pulse rapid, but of good volume. His urine was of sp. gr. 1028, and contained no albumen, bile, or sugar. He lay with his legs drawn up.

I explored the swelling with a fine aspirating needle, and drew off a single drop of pus. I did not feel sure whether this came from an abscess deep in the abdominal wall or from the liver.

He came into St. Bartholomew's Hospital on the following day, and at my request Mr. Walsham made an incision in the swelling. After a very deep incision parallel to the right costal arch, eight ounces of very fetid pus came out. The abscess cavity seemed to have a definite wall, no part of which was affected by respiration.

The operation gave great relief, and was followed by diminution of pain and by a good night.

A discoloured, ill-smelling discharge continued till March 19, when it became more purulent. On March 24 there was less discharge and less odour with it.

On March 27 a gall-stone with facets was discharged from the wound, and the purulent discharge diminished and became quite sweet.

The next day eighteen more small gall-stones of the same form were discharged, and on March 30 two more. On April 2 another gall-stone, and on April 3 there was still much discharge. On April 4, when the wound was washed out, forty-two more gall-stones appeared, and on April 6 seventeen more. On April 8 six small gall-stones came away, and a larger one could be felt fixed in the lower side of the opening. Six more came out between the 9th and 17th.

On the 17th the patient was put under chloroform, and eighty-one stones, including two each as large as a good-sized marble, were taken out.

He felt very much better the next day, and only one more stone appeared.

On May 8 only a small sinus was left, and early in June this had closed, and the patient was quite well. After an interval

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of several months I saw him again, and he said that he had been quite well and had had no pain in the region of the abscess. His abdomen seemed in every way normal.

His temperature chart after his admission showed a slight evening rise, with occasional higher fluctuations.

Morgagni (Epist. xxxviii. 43) mentions that Michael Mercati, a physician who wrote on the plague and on gout, was found on his death in 1593 to have thirty-six calculi in his gall-bladder, and yet never had biliary colic or jaundice. A jar containing many more small gall-stones removed post-mortem from the gall-bladder of Mr. Babbage, the inventor of the calculating-machine, is preserved in our Museum, and that he never suffered from pain due to them is proved by the absence of any mention of colic in his autobiography, a work which dwells at length on his inconveniences during life.

These complete examples from cases of gall-stones occurring in good observers are of course confirmed by very many others, in which the evidence is less complete as to the frequent absence of colic and of jaundice, in spite of the presence of numerous gall-stones.

The passage of 175 through a wound, after the formation in connection with the gall-bladder of a large abscess, and followed by the complete recovery of the patient, must be very rare. The fœtid odour of the pus, it is worth remarking, was probably due to the contact of the abscess with the colon containing fæcal matter.

## Case II.

Elizabeth C., aged 60 years, came to my out-patient room on May 22, 1889, complaining of an abdominal tumour. She said that fifteen weeks before she first had pain in the pit of the stomach. It lasted three weeks, and was accompanied by sickness, but she never had jaundice. In April she noticed a swelling in her abdomen. Below the lower margin of the ribs, on the right side, there was a well-marked swelling about the size of a cocoa-nut. This was dull to light percussion, but on deep percussion some resonance was obtained. It was difficult to be sure whether it moved with the liver or no. The upper limit of hepatic dulness was normal.

Nothing abnormal was discovered in the chest. The pulse was 104, and of good volume. Temperature 99.4°. Urine, sp. gr. 1028; no albumen, bile, or sugar.

An aspirating needle at a depth of two inches drew off some pus without odour.

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Seen in the light of the former case, the diagnosis was clear. Mr. Walsham, at my request, opened the abscess and let out about two ounces of pus. The cavity of the abscess seemed sacculated. A tube was passed into the cavity, and the wound was dressed with iodoform gauze. There was a healthy discharge from the wound, which continued to be copious till July 2, when nine faceted gall-stones came out of the wound. On July 6 the wound was opened again, and four gall-stones washed out. On the 27th the wound, which had become a sinus, was enlarged, and ten gall-stones were extracted. A copious muco-purulent discharge continued, and this remained on August 20.

Two months later there was still some discharge, a few drops a day, but the patient had no abdominal pain, and was otherwise well.

Since this paper was written, the patient has come to the Hospital again. She has still a discharge from the wound, and three months ago two more gall-stones came out. She is not emaciated, and her abdomen (December 14, 1892) shows no other abnormal condition.

In her case there had been colic, but no jaundice. Twenty-five gall-stones have come through the wound.

These two cases point to the comparative ease with which a gall-bladder distended with calculi may sometimes be emptied by incision through the anterior abdominal wall. They help us to answer a question put by Morgagni in his interesting letter on jaundice and bilious calculi: "Last of all, although there were no danger in cutting, can you suppose there would be no great difficulty in healing the wound? We have before our eyes examples of three women, one of Bologna, one of Frankfort, and one of Göttingen, in whom a tumour having arisen in the epigastrium, and being opened, either by art or spontaneously, discharged cystic calculi at its aperture. I read that the first was cured, that the second had a fistula left, by which a thin and chylous kind of liquor, but of a yellow colour, distilled, and the third had an ulcer remain, which, with its sinus, discharged bilious calculi at times."

In a case of protracted jaundice it is often difficult to decide what is the cause of the jaundice. In vol. xvii. of these Reports I have tried to demonstrate under what circumstances it may probably be due to primary malignant disease of the pancreas, and in the Pathological Transactions, vol. xxxi., have described a case in which it was due to primary carcinoma of the common bile duct.

The following case is instructive as an illustration that prolonged jaundice with extreme emaciation does not prove the presence of malignant disease.

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William D., a glover of Worcester, came to my out-patient room on October 9, 1891. He had then had slight jaundice for eighteen months, but his stools were normal in colour. His temperature, taken night and morning for five days, was normal, as were his pulse and respiration. Nothing abnormal was discoverable in his chest or abdomen. He came into Luke Ward for five days, and then was an out-patient under my care till November 7, when he was no longer jaundiced.

On April 18, 1892, he again came into Luke Ward, the jaundice having returned six weeks before. He had lost flesh since November 1891. His stools were dark-coloured.

*Physical signs.*—The abdomen was thin; spleen not felt, and no tumour to be felt. Chest normal. Urine, sp. gr. 1020; no bile pigment; no albumen.

The jaundice increased till May 4. I then gave him half an ounce of olive-oil three times a day. It seemed to cause some diarrhœa for a day or two, but by May 27 the jaundice was less, and he felt much better.

On June 27 he left the Hospital still jaundiced. His stools were dark. He was anæmic, had a pale abraded tongue, and was feeble. His temperature had been slightly raised in the evening from May 9 to June 7, but only once reached 100°. He had occasional slight diarrhœa.

The long duration of his illness made me think that the cause of the jaundice was not malignant disease. I had never been able to feel the gall-bladder, and the liver had never been enlarged. He had no colic. In the third week of October 1892 he came to the Hospital to see me, and was in good condition, free from jaundice, feeling quite well, and with a healthy colour in his cheeks. He has sent me the following account of the subsequent course of his disease.

"The following will be a brief account of myself since I left the Hospital to the present time. Arrangements were made in the latter part of June for me to come to my home here in Worcester for a change of air for a few weeks, to return on August 8. After being here for a time, it was found that I did not get any better. So I was taken into Somerset, my native county, hoping that I should receive good from being there. I soon found that instead of getting better, I got worse every day. Every time I had the use of my bowels I fainted, and sometimes on other occasions. I could not dress, or, in fact, do anything for myself. After a stay of nearly a fortnight, I was obliged to return to Worcester instead of coming to the Hospital. I became worse in every way, weaker; no appetite, only for fruit. I took to my bed, and I felt that I was really dying. My colour

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was quite as bad as it was in the Hospital. The beatings in my head became worse; it was incessant night and day. For some four or five days I had been constipated; two doses of castor-oil was given me, and, after a time, relief came, but I shall never be able to describe the pain I endured. To me it felt as if all that came from me were hard substances, but the nurse could not thoroughly examine it in consequence of the fearful bad smell.

"On or about that time a physician was sent for, but he told my wife and the nurse that he could not possibly do anything for me; that his opinion of me that I had a cancer had not changed in the least. So he said, 'It is impossible for him to live.' He came and saw me, and then told me in the presence of those around me that I was dying, and that I could not live forty-eight hours. 'It would be useless,' he said, 'in giving him medicine, for nothing could possibly do him good.' I felt that this physician was right, for I felt that I really was dying, and every one that saw me was of the same opinion. I had no memory, my thinking powers were gone; only at intervals could I fix my mind on the future; my wife and others in my room had to me assumed the form of animals. I frequently talked, I have been told, but I knew nothing about it myself, nor could anything be made of what I said. Two or three days afterwards a doctor (a student under you many years ago at St. Bartholomew's) was sent for; he was quite as decided as the physician in pronouncing upon me, with this exception, 'Instead of living only forty-eight hours,' he said, 'he may live ten days, but it was not possible for me to be alive after that.' He too could not give me anything to do me good; but as an afterthought he said, 'Yes, I can give him something that may act as a 'pick-me-up' for a few days.' He then prescribed a teaspoonful of carbolic, to be taken three times a day. Even at that he said I could not live longer than ten days. A day or so after that a new doctor came to see me, who had not been in the city but a few hours. He came to my room, and in less than a minute he said to me, 'I hear that you are dying; I have been told so on my way to see you; but you are not going to die; I will cure you!' Those words coming from a doctor acted like magic upon me. He said he would cure me. I believed him at once. After taking four doses of his medicine the yellow colour left me, and in seven or eight days I was walking in the garden, only still very weak, but getting stronger every day. He prescribed two or three different sorts of medicine, and in a very short time I found new life coming back to me; the new blood seemed to rush through my body; the beatings in my head had ceased, my appetite

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returned, my flesh became pink—hands especially were quite red. The doctor then ordered me to the hills at Malvern, where I stayed for more than three weeks in a house some distance up the hill. In less than a week I had climbed to the top, a height of about 1500 feet; a few days after that I did it twice a day; for the doctor's orders were that I was 'to climb.' During my stay on the hills I gained in weight 9½ lbs. I have been gradually getting better ever since. This week I have been to my work, and up to the present I find that I have not suffered in any way. I am looked upon here by every one as being miraculously cured, and even now I am daily receiving the congratulations of the people. I do not think I can add more, only to say I thank you, sir, for all you did for me during my stay in the Hospital."

His sudden alteration for the better is probably to be ascribed to the castor-oil, which aided the ultimate passage of a gall-stone which had partially obstructed the flow of bile for two years and a half.



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ON THE

# INTRAPLEURAL PRESSURE AND MANNER OF CONTRACTION OF THE LUNG IN PLEURAL EFFUSION.

BY

JAMES CALVERT, M.D.

It is the opinion held by many authorities, and consequently it is the teaching of many text-books on medicine, that in pleural effusion there can be no positive intrapleural pressure until the elasticity of the lung is exhausted—until the lung is completely collapsed.

Thus, Dr. Douglas Powell[1] writes:—"The negative pressure is maintained within the pleura until the lung has completely contracted before the advancing fluid."

And Dr. F. Taylor[2] writes:—"But with a large quantity a point is reached beyond the elastic collapse of the lung, and then this organ and the surrounding parts are actually subject to the positive pressure of the fluid."

And Dr. Carter[3] writes in italics:—"No direct pressure can be exerted by the fluid until the elastic retraction of the lung is exhausted."

It would be easy, but unnecessary, by further quotation to show how widely this view has been accepted.

I think all men are agreed that the lung cannot be subjected to a positive pressure by an effusion until it is completely collapsed, but the pressure upon the lung does not measure the pressure everywhere within the pleural cavity. Dr. Powell and Dr. Taylor do not seem to draw any distinction between the two. Surely the pressure at the surface of an effusion, where

[1] Diseases of Lungs and Pleura, 1886.
[2] Practice of Medicine, 1891.
[3] Elements of Medicine, 1891.

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the liquid is in contact with the lung, must differ from the pressure at the level of the diaphragm by the weight of the superincumbent fluid (patient in sitting position), so that the pressure upon the lung may well be negative or zero, when the pressure on the heart or at the level of the diaphragm is positive.

The elasticity of the lung on ordinary inspiration = about 9 mm. Hg.,
∴ the pressure on the diaphragm = A − 9 mm. Hg., where
A = atmospheric pressure.
Now 9 mm. Hg. = about 4 inches of the fluid of pleural effusion.

Thus, supposing the elasticity of the lung to remain constant, it is evident that an effusion can collect on the surface of the diaphragm to the depth of about 4 inches before the intrapleural pressure—during inspiration—at the level of the diaphragm becomes positive (patient in sitting position). But the elasticity does not remain constant; on the contrary, as the effusion rises, the lung contracts and its elasticity diminishes.

How exactly the lung contracts in presence of effusion is disputed. The majority of people, however, believe that it makes room by a general contraction of its substance—no part of it becoming absolutely collapsed, but the whole of it less expanded. But there are others, who, following Cohnheim, hold that the lung adapts itself to the diminishing space, not by a general contraction, but by the collapse of a sufficient number of its lowest vesicles—the expansion of the rest of it remaining unaltered.

Thus, Dr. Fagge[1] writes:—"The presence of even a few ounces of liquid in any part of the pleural cavity causes a total collapse of the pulmonary tissue which ought to occupy that space."

And Dr. Bristowe:[2]—"As the fluid rises in the thorax, more and more of the lung, commencing with its lower part, has the air squeezed out of it."

So also Dr. Widal:[3]—"At first the effusion collapses and thus renders airless the lowest part of the lung."

And so also many others.

This latter view is a difficult one to accept, and if it be a true one, it certainly seems to commit us to the belief that this manner of contraction must be due to the force of cohesion between the pleural surfaces, demonstrated by Dr. West in his Bradshaw Lectures.

It appeared to me, that supposing a manometer were placed in communication with the pleural cavity, at the level, say, of the third intercostal space, and fluid were let into the pleura at the level of the

[1] Principles and Practice of Medicine, 1888.
[2] Theory and Practice of Medicine, 1890.
[3] Dict. Encyclop. des Scien. Med., 1888.

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diaphragm, then, if the lung contracted as a whole, the negative pressure shown by the manometer ought to diminish gradually as the fluid rose in the thorax; but if the lung made room by the collapse of its lowest vesicles—the rest of it remaining unaltered—that the manometer would show no diminution of the negative pressure until the fluid reached the level of the third space. Therefore, I made experiments on dogs; they were about the size of the ordinary fox-terrier. They were anæsthetised by chloroform 1 part, ether 2 parts, absolute alcohol 1 part. When under the anæsthetic they were attached to a dog-board and placed in the perpendicular position.

I soon found that no certain conclusion could be drawn from dogs whilst they were still breathing. The respirations constantly vary in depth, and therefore cause corresponding variations in the negative pressure registered by the manometer. The results, however, certainly seemed to be in favour of a general contraction of lung. I found it much more satisfactory—after marking the respiratory oscillation, and thus being sure the instrument was properly placed—to eliminate the breathing variations by killing the dog with an overdose of the anæsthetic.

*Example*:—

Manometer inserted $3\frac{1}{2}$ inches above the level of cannula letting fluid into pleura. Dog then killed.

Manometer registers minus $3\frac{1}{2}$ inches (of salt sol., sp. gr. 1015).

7 oz. (salt sol., sp. gr. 1015) let in:—

Manometer registers minus 3 inches.

15 oz. let in:—

Manometer registers minus $2\frac{1}{2}$ inches.

No more fluid was admitted. By percussion, and by using the exploring syringe, the level of the fluid was found to be $1\frac{3}{4}$ inches below the level of the manometer.

The experiment was repeated several times with similar results, viz., that the manometer registered a diminishing negative pressure as the fluid collected in the pleura—evidence, therefore, that the lung makes room by a general contraction, not by the collapse of its lowest vesicles. Moreover, by cutting away the intercostal muscles, and thus laying bare the parietal pleura, it is quite easy actually to watch the behaviour of the lung in presence of the collecting fluid:—the fluid is let in at the lowest part of the pleural cavity, and the manometer shows a diminishing negative pressure, so also, through pleural windows in the second, third, and fourth intercostal spaces, near the sternum, the lung, by means of the pigment upon its surface, can easily be seen to be contracting.

And through such pleural windows a general contraction of the lung can be seen when, before any experiment has begun, pressure slowly and carefully exerted upon the abdomen causes the diaphragm to rise.

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Suppose, then, the lung to contract as a whole, and suppose the effusion to fill half the pleural cavity, the lung must occupy half its usual space, and its elasticity must be reduced by half. Therefore two inches below the surface the pressure must be positive. How much the more, then, must there be positive intrapleural pressure just before the lung is completely collapsed —a condition in which the elasticity is reduced almost to zero, and the effusion occupies, at least, almost three-fourths of the pleural cavity.

If the lung, as Cohnheim teaches, makes room by the collapse of its lowest vesicles, it is evident that very small effusions indeed must cause a positive intrapleural pressure, because the pressure within the bronchioles leading to the collapsed vesicles must act without any diminution directly upon the fluid.

Homolle,[1] following Quincke, Peyrot, and others, after a prolonged experience in tapping pleural effusions with a manometer attached, concluded that the intrapleural pressure, in the absence of adhesions, was very rarely negative—nearly always positive—even in small effusions. Moreover, even in small effusions, that part of the chest-wall in contact with the fluid is expanded, and the intercostal spaces are full: clinical evidence certainly suggesting positive intrapleural pressure at that level.

It is, of course, no uncommon experience in tapping even very large effusions to find that the fluid refuses to flow through the cannula, thus demonstrating negative, not positive, pressure within; yet the explanation seems easy: the effusion has ceased to increase, has begun to decrease; but the lung, held by adhesions, cannot expand sufficiently to keep up the pressure upon the diminishing fluid.

In such cases it may be noticed before the operation that the chest-wall in contact with the effusion is not so much expanded, nor are the intercostal spaces so full.

Thus it appeared to me impossible to believe that "the negative pressure is maintained within the pleura until the lung has completely contracted before the advancing fluid."

To test the matter further, I began a series of experiments on dogs, about the same size as before, anæsthetised as before, and suspended as before in the perpendicular position.

A cannula was inserted into the lowest part of the pleura, and connected on the one hand with a manometer filled with solution of salt, sp. gr. 1015, and on the other hand with a graduated vessel containing a similar salt solution kept at about the temperature of the body.

It was found that when 10 to 15 oz. had been passed through

[1] Revue Mensuelle de Médicine et de Chirurgie, 1879.

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the cannula, the intrapleural pressure at the lowest part of the pleural cavity remained positive during ordinary inspiration and expiration.

The mediastinum of a dog readily permits fluid to flow from one pleura into the other, and on examination after death equal quantities were found in each cavity.

Therefore an amount of fluid—5 to 7 oz.—occupying about one-fourth of the pleural cavity is sufficient to give at its lowest part a positive intrapleural pressure, the other three-fourths of the cavity being occupied by uncollapsed lung.

Further, by exposing the parietal pleura, it is easy to see this uncollapsed lung in position against the chest-wall.

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# ILLUSTRATIONS OF LANDRY'S PARALYSIS.

BY

J. A. ORMEROD, M.D.

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The disease known sometimes as Landry's paralysis, sometimes as acute ascending paralysis, has the following characters. A paralysis, mainly motor, though often preceded or accompanied by paræsthesiæ and blunting of sensation, attacks the lower limbs, and spreads quickly and successively to the trunk, upper limbs, muscles of respiration and deglutition, and it may be the facial muscles. It increases rapidly in degree also—the legs may become quite paralysed in a few days. The paralysis is of the flaccid type, *i.e.*, the muscles are relaxed and flabby, and the tendon-reflexes abolished; therein it resembles paralysis due to disease of the anterior cornual cells, nerves, or nerve-endings. It differs from such disease in that the electrical reactions of the muscles remain normal, nor is there definite muscular atrophy. As a rule, defæcation and micturition are not gravely affected, nor is there a rapid development of bed-sores or cystitis. In these points, and in the absence of complete anæsthesia, it differs from an upward spreading myelitis. Neither is pain a leading symptom, as in an acute spinal meningitis. The disease is usually fatal; in cases which recover, the paralysis recedes from the several parts of the body in the inverse order of its development. The symptomatology is thus tolerably simple, and well expressed by the name "acute ascending paralysis." Nevertheless, the paralysis has been known to begin in the upper districts of the body, and to work its way downwards, as in the case of the famous Cuvier.

The morbid anatomy is still to seek. For in well-marked cases the most skilled observers have searched in vain for organic disease, coarse or microscopical. True, lesions have been found, such as meningitis (Hun, Hoffman), peripheral neuritis (Pitres and Vaillard), disease of nerve-roots (Eisenlohr), anterior poliomyelitis (Immermann); but no one of them is

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constant, and often there are none of them. Erb aptly compares the instance of tetanus, in which severe, and even fatal, spinal symptoms are exhibited without discoverable spinal lesion.

The causation is obscure. It seems sometimes to be related to syphilis, sometimes it follows exposure to cold, sometimes an acute infectious disease. This last circumstance, coupled with the fact that the spleen is enlarged, suggests that it has a bacterial origin. A remarkable case is given by Bristowe, in which a man died with the symptoms of Landry's paralysis who had been bitten by a mad dog, and whose tissues were shown to contain the virus of rabies.

There may be difficulty of diagnosis from an extensive anterior poliomyelitis, and still more from a generalised peripheral neuritis. As to treatment, nothing special is known, save that on the strength of one remarkable case (Sorgenfrey) large doses of ergotin have been recommended.

Of the four cases which follow, the first was considered by Dr. Gee (under whose care the patient was) to be a typical Landry's paralysis. The other three, though perhaps less typical, are most naturally referred to this heading, particularly in view of the negative post-mortem data. I am indebted to Dr. Gee and Dr. Church for leave to publish the cases. The clinical notes are by their then house-physicians, Drs. Rolleston, Rivers, E. Moore, and C. E. Williams. The post-mortems and microscopical examinations are my own contribution. I have to regret the absence of bacteriological investigations. The purely negative result in respect of morbid anatomy is also unsatisfactory; for though this accords with the previous and more minute investigations of others, it leaves an uncomfortable feeling that something may have been, after all care, overlooked.

### Case I.

*First symptoms two days after exposure to prolonged cold in a swimming-bath—Loss of power became complete in the legs three days later—In two more days, arms and facial muscles involved—Paralysis of soft palate—Death, apparently from respiratory paralysis, about eight days after the onset.*

*Post-mortem:—Lungs congested; spleen enlarged; nervous system normal.*

William Gardner G., aged 20, warehouseman, admitted to Luke Ward, care of Dr. Gee, October 3, 1890.

October 3.—*Previous history.*—Scarlet fever in childhood.

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Dog bites on nose at twelve years of age. The dog was healthy some years later. No scar remains.

Always strong and healthy. No ill-health during past twelve months.

*Family history.*—Father, mother, and brothers alive and well.

*History of present illness.*—September 24.—Patient competed at a swimming race, and remained over-long in the water. No ill effects felt the next day.

September 26.—Was to play in a football match in the afternoon. When taking the kick-off, his leg "refused to act," owing to a sudden weakness, and he fell to the ground. He was compelled to leave the ground, but seemed no worse later in the day, and ate a good dinner.

September 27.—Slight indisposition and weakness; was able without marked difficulty to walk to the station (five or six minutes' walk), and return to his house of business.

September 28.—Felt weak, and stopped in bedroom all day.

September 29.—Towards evening weakness in legs became marked, and he lost power in them completely.

October 1.—Arms feeling weak. This condition progressed until he lost the use of his arms, then the muscles of the face became affected.

October 2.—Seen by a medical man, who reports complete paralysis of both legs, and almost complete paralysis of arms, paralysis of both sides of face in lower half, and commencing paralysis of orbicularis palpebrarum. Optic discs natural.

October 4.—*Present condition.*—A strongly built, well-nourished youth, of spare habit. Expression anxious; no dilatation of alæ nasi; is breathing regularly, and without difficulty. Complains of slight uneasiness in throat on swallowing, but performs this act well and easily.

*Eyes.*—Pupils equal; natural size; act perfectly; no squint; intra-orbital muscles act perfectly.

Facial paralysis complete in lower half of face; partial paralysis of both orbiculares palpebrarum; most marked on right side. Occipito-frontalis paralysed.

Tongue clean; protruded straight. Paralysis of lip muscles; labials blurred in pronunciation.

Soft palate seems paralysed on right side; uvula deflected to left side.

Hearing and vision normal.

*Chest.*—Heart's apex-beat natural; sounds natural. Lungs nothing abnormal. Intercostals and diaphragm acting well (at 1 P.M.).

*Abdomen.*—Natural. Muscles of abdominal wall act naturally.

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*Limbs.*—Complete paralysis of lower limbs, with possibly some slight retention of power to rotate the thighs inward. As to upper limbs, paralysis of arms; fore-arms can be flexed at elbow, but with much diminished force, and only when assisted by position; slight power of supination and pronation; movements of wrists very weak; fingers moved only feebly. No power of grasp in either hand. Elevators of shoulders act with some force; deltoids paralysed.

*Sensation.*—Tactile sense perfect all over, except that firm pressure is necessary to cause sensation in the skin of the soles of feet; this skin is not very much thickened. Thermal sense not tested. No analgesia.

*Electrical reactions.*—Normal reaction to faradism in all the paralysed muscles.

*Reflexes.*—Both tendon and skin reflexes are absent in limbs and trunk. Pupils react to light.

Complete control over bladder and rectum. No retention. Can tell when he wants to pass water. Bowels not opened for three days.

Temperature normal. Urine acid, sp. gr. 1028; no albumen, no sugar.

This condition continued unaltered till 6 P.M.; then the breathing began to be laboured, and patient experienced some sense of discomfort. Respiration became more and more difficult, and accessory muscles of respiration were called into play, especially those of neck; while the action of intercostal muscles and diaphragm became more and more feeble. Patient became unconscious about 7.30 P.M., and died from failure of respiratory muscles about 8 P.M. The intercostals and diaphragm seemed to cease work at the same time. The recti abdominis were acting to the last, assisting expiration. A loud systolic murmur, heard all over the front of the cardiac region, was developed about an hour before death.

The intelligence and memory and use of special senses were retained up to half-an-hour before death. The heart continued to beat a minute or two after respiration ceased.

*Post-mortem next day.*—A well-nourished man. Marks of a blister on the back. Rigor mortis present.

*Brain* appeared perfectly normal.

*Spinal cord.*—The most that could be said was that the inner surface of the dura was of a pink colour, and there was some softening, apparently post-mortem, of the lower dorsal region; also that some of the nerve-roots in the lower dorsal region looked red (and swollen ?).

*Nerves.*—The left anterior tibial nerve from the centre of the

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leg, and the right sciatic nerve, popliteal, peroneal, and anterior tibial were removed; and also the left vagus from the centre of the neck; these appeared quite normal to the naked eye. They were hardened in Müller's fluid.

*Œsophagus* normal.

*Trachea* congested.

*Pleuræ* both universally adherent; much congestion of both *lungs.*

*Heart* weighed 13 oz.; in other respects quite normal.

*Aorta and vessels* normal.

*Stomach* showed some small capillary hæmorrhages.

*Spleen* large and elongated (though not projecting below the ribs), deeply divided by the usual fissure. It did not feel tense or hard, nor, on the other hand, was the capsule wrinkled. Section soft and dark red. Weight 18½ oz.

*Kidneys* dark with blood, otherwise normal.

*Pancreas* rather red and soft.

Intestines, liver, and other abdominal viscera normal.

The following parts have since been examined microscopically:—

(1.) Sciatic trunk (left), peroneal near its division, branch to extensor communis digitorum, tibialis anticus muscle with the nerve entering it, extensor communis digitorum with the nerve entering it. They were stained partly with picro-carmine, partly with Weigert's stain, and no abnormality could be detected. Pneumogastric nerve-trunk (picro-carmine, Weigert, anilin blue-black) also normal.

(2.) Spinal cord.—Lumbar enlargement, three levels (anilin blue-black, carmine, Pal-Weigert's stain), normal. Dorsal region (three or four levels), cervico-dorsal region, cervical enlargement (three levels), upper cervical region, mostly stained with sodium carminate, all quite normal.

(3.) Medulla at level of calamus scriptorius (picro-carmine, Weigert, anilin blue-black), normal.

(4.) Cerebrum, motor area of cortex (similarly stained), normal.

## Case II.

*Onset eleven days before admission with pain in back, then cough, pain in legs, loss of power in legs—On admission, formication, &c., hands and feet, variable paralysis of legs —Typhoid condition developed, though with slight fever— Urine retained or passed in bed—Impairment of sensation in legs and hands—No bedsores—Paralysis of intercostals—Death about sixteen days from onset—No cause assigned for the disease.*

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*Post-mortem :—Some old caseous patches in apices of lungs—Spleen enlarged—Nervous system (except for very trivial affection of the meninges) quite normal.*

Samuel L., aged 33, was admitted to Matthew Ward, care of Dr. Church, on December 24, 1888, suffering from loss of power in the lower limbs, of recent origin.

*History.*—On December 13, pain in the back. December 16, retched a great deal, and had bad cough. December 17, cough better, no vomiting. December 19, pain, passing up from the legs to the left side of chest. Since that date getting worse; complained that the bed seemed to move while he was in it. Denies syphilis; drinks, but not excessively. Never laid up before, though he has had a winter cough.

*Present condition, December 24.*—Bloated face; breath not alcoholic; conjunctivæ congested and glistening; pupils equal; tongue furred slightly; voice husky; manner strange. Temperature normal; pulse 88; respiration 24. Complains of no headache; has pain in back on exertion, not while at rest; feeling of constriction round epigastrium; no tender spots over the spine. Formication and feeling of swelling in hands and feet. No pain when the muscles are grasped, though he appears to have had some pain when being washed. Patellar tendon-reflexes absent. Can move legs, but not well, their condition being somewhat variable. Impairment of sensation in hands.

Ordered *Dieta Lactis*, a purgative pill and draught, quinine and iodide of potassium draught.

December 25.—Temperature: morning, normal; evening, 100°. Pulse 92.

December 26.—Temperature: morning, 99°; evening, 100°. Pulse 84; respiration, 30. Typhoid condition with restlessness. Respiration seems entirely diaphragmatic. Rhonchus and sibilus over whole of lungs; cardiac dulness encroached upon, begins at fifth rib. Abdomen somewhat full, otherwise normal. Spleen not felt. Bladder distended; passes water in bed. Urine sp. gr. 1030, acid, no albumen.

Ordered essence half a pint; brandy, ʒiv.; ext. ergotæ liquid. 3ss.; ex Hst. pot. citrat. ʒi. 6tis horis.

At 12.30 night, slight difficulty in swallowing is noted; he can, however, move his legs fairly well. Passes urine into bed. A pint and a half drawn off by catheter. Bowels very freely opened after purgatives.

December 27.—Wandering, but easily recalled; taking food fairly. Dry fissured tongue. Sensation in legs much impaired.

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Temperature: morning, 99°; evening, 100°. Pulse 90; respiration, 36.

December 28.—Temperature 102.2°; pulse 100; respiration 38. Copious rhonchus over both lungs. Very restless, no sleep last night. This morning rolled out of bed. Cheeks puffed out as he breathes. Floccitatio. Optic discs normal. Nothing like a bedsore throughout his illness. Evening temperature 100.6°. Given a small injection of morphia at 6.30 P.M., and again at midnight.

Midnight.—Sleepless and restless, dragging clothes off the bed and talking. Passing urine into bed.

2 A.M. next morning, turned over in bed, and shortly after stopped breathing and died.

*Post-mortem* twelve hours after death.—A large muscular man.

Except for a slightly granular appearance of the pia arachnoid upon the convexity, the *brain and its envelopes* seemed perfectly normal; the cerebral vessels were also normal.

*Spinal cord.*—Small white spots, size of pin-head, upon the arachnoid, but no trace of lymph or of adhesion or thickening of the membranes; the cord itself was normal.

A portion of the right anterior tibial nerve, which was removed from the middle third of the leg, looked normal.

*Lungs.*—Old caseous patches, with wrinkling of surface of pleura at both apices.

*Heart, aorta, and vessels* normal.

*Liver* large, but structure normal.

*Spleen* enlarged, measuring six or seven inches in length. Structure soft, but otherwise normal. No note of its weight.

*Kidneys* rather large and coarse.

The other abdominal viscera were normal.

After hardening the cord in Müller's fluid thoroughly, no morbid change could be seen in it to the naked eye. Microscopically, also, in sections (from the lumbar enlargement, dorsal regions, cervical enlargement, and upper cervical regions) stained in carmine or in anilin blue-black, I could find nothing abnormal. The anterior tibial nerve was hardened partly in Müller's fluid, partly in osmic acid; teased specimens appeared normal. Similarly, nerves from the cauda equina, stained by Weigert's method and by picro-carmine, showed no change.

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## Case III.

*Probable intemperance—Fall of twenty feet two or three weeks before first symptoms—Onset of disease gradual—Aching, paræsthenicæ, swelling, and loss of power in legs during a month, then similar symptoms in arms—Vomiting—Difficult micturition—Fits of uncertain nature just before death.*

*Post-mortem:—Dilated heart—Pleural effusion—Inflammation, ulceration, and dilatation of stomach—Spleen small—Nervous system normal.*

James D., aged 29, ironworker, was admitted to Luke Ward, care of Dr. Gee, on December 29, 1888.

*History.*—Six or seven weeks ago he fell about twenty feet. A fortnight later began to complain of aching of legs and of pins and needles. The legs swelled. Since then the legs have gradually become weak, and for five days he has been unable to stand. During the last week, aching and feeling of pins and needles in hands and arms, and arms have been getting weak. During last two days, difficulty in passing water and no action of the bowels. Frequent vomiting since illness began, and for several days a feeling of soreness over the belly. No severe pains of any kind.

Always a healthy man, except that for many years has had "bilious attacks." Fits when a baby. Denies syphilis. Has not drunk much beer, but a very small quantity makes him tipsy. (The Sister of the ward, however, doubts his sobriety, as she heard, from other sources, that he used to be the worse for liquor at least once a week.)

*Present condition.*—Face and extremities blue and cold; tongue thickly coated; pulse very small and weak; temperature, 95°; respiration, 32; pupils act naturally; fundus of eyes natural.

Chest rounded in shape; impaired resonance at base of right lung; rhonchus over back of chest. Heart's apex-beat in fifth interspace, half-inch outside nipple-line; dulness extends up to third rib, but not to right of sternum; action slow and irregular; systolic murmur at apex.

Tenderness in epigastrium; liver can be felt; a large area of tympanitic resonance in abdomen, and distinct splashing. Back œdematous.

Legs very slightly swollen; they are weak; he moves them with difficulty, and cannot stand. Knee-jerks absent. Hands very weak. No muscular atrophy, nor rigidity.

December 30.—This morning at 6 A.M. had a sort of fit, lasting a very short time; eyes wide open and staring; breathing

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stertorous; passed water into bed; no convulsions. Three somewhat similar attacks since. Is very restless; pulse extremely weak; temperature, 96.5°.

He became rapidly worse, and died in the evening.

*Post-mortem* some fourteen hours after death.—A well-made, fairly muscular man. Loss of one finger of left hand.

*Brain and envelopes* normal, except that the arachnoid had a frothy appearance from bubbles of air (post-mortem); cerebral vessels normal.

*Spinal cord.*—Much fluid escaped as the dura was incised; the cord itself, however, looked quite healthy.

Both vagus nerves, from root of neck and upper part of chest, and part of right anterior tibial nerve, were removed. They appeared normal.

*Lungs.*—In left pleura about a pint, in right about 1½ pint of clear fluid. Some œdema of lungs, with collapse at both bases.

*Heart.*—Very large, distended with clot. Right cavities dilated; walls thin and firm. Tricuspid orifice took four finger-points. Left cavities much dilated; muscular tissue of ventricle soft, pale; edge of mitral valve slightly thickened at one point. Aortic valves quite normal.

*Peritoneum* contained much clear fluid.

*Stomach* considerably dilated; interior universally reddened, and covered with tenacious mucus. On posterior surface (of pyloric half of stomach) an ulcer, rounded, size of threepenny-piece; edges thickened. It had nearly perforated to the pancreas. There were also two other ulcers, smaller and less deep.

*Liver* rather large. Weight 70 oz. Texture firm; not definitely nutmegy.

*Spleen* small and firm.

*Kidneys* rather large; very firm in texture.

The other abdominal organs were normal.

I examined the following parts microscopically:—

Pneumo-gastric nerves and anterior tibial nerves, both in sections and teased specimens, stained mostly with osmic acid and picro-carmine. In these I could find nothing abnormal.

Spinal cord.—Sections from lumbar enlargement (3 levels), dorsal regions (3 levels), cervical enlargement (2 levels), upper cervical region. Medulla about point of calamus; stained with anilin or picro-carmine. These also were normal.



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## Case IV.

*Intemperance for eighteen months—History a little uncertain—Acute attack (nature?) three weeks before admission, then pain and loss of power in arms—Pins and needles in arms and legs—Loss of power in legs, but able to work till a week before admission, when he found himself unable to get out of bed.*

*On admission, legs more paralysed than arms—Impaired sensation—Some difficulty in micturition—Died in two days more, deglutition and respiration being affected.*

*Post-mortem:—Dilatation of heart, especially right side—Œdema of lungs—Spleen rather large—Nervous system, slight thickening of cerebral arachnoid, but otherwise no abnormality.*

Edward W., aged 40, butcher (occupied in pickling pork), admitted to Luke Ward, care of Dr. Gee, March 21, 1890.

It appears that he had been a steady, sober man till about eighteen months ago. He then made the acquaintance of a woman who was a great drunkard, and then they both drank very heavily till the time of his admission.

Three weeks before admission he had what he calls influenza, the symptoms being shivering, movement, and pain in the hands and arms; they felt hot, and he could not bear the weight of the clothes upon them.

Constant vomiting; bad appetite.

Seven days ago he could not get out of bed.

Three days ago he suddenly became worse during the night.

Lately has had a winter cough.

The source of the above statements is not mentioned in the notes. The patient's own statements were as follows:—Since March 12 gradual weakness across the arms came on, and the same in the legs. March 15, began to feel pins and needles in the same limbs, but was able to keep on his work till the night of Saturday, March 15. One or two days before that date his eyes became misty; he could not see to read, but did not see double. No power of smell for several months, though this "comes back every now and again." No taste the last three or four days.

Is quite aware when he passes his motions or urine. Says he can feel a touch on either arms or legs, but cannot move legs at all. Was able to pick up small objects till a day or two ago.

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Memory good. No headache now; had a slight headache yesterday, which soon passed off. Appetite bad; has brought up his food once or twice during the last week or two. No sleep, he says, during the last five nights.

No history of fits (at any time of his life); no blow, strain, or wetting. Denies syphilis and gonorrhœa.

Nothing important in his family history; he has two healthy children.

*Present condition.*—A healthy-looking man. No sign of facial palsy. Tongue very tremulous and coated. Pupils react to light and accommodation; fundi natural.

Pulse 116, full and soft. Temperature 98°. Some cough. Sputum either green or rusty and opaque.

*Chest* barrel-shaped; physical examination reveals nothing except a little sonorous râle.

*Abdomen.*—Nil.

*Arms.*—Muscles flabby, but not smaller than natural. No tendon-reflexes. Left arm palsied to some degree. Right arm less so; the right grasp is best of the two.

*Legs.*—Not markedly wasted, but thin. No tendon-reflexes. His shins and legs are tender; the legs are palsied to a great degree.

He has no pain, but complains of pins and needles.

Last action of bowels two days ago, and before that they were quite regular.

To these notes Dr. Gee adds the following:—Intercostal movements pretty good. Cough rather ineffectual. Legs very much more paralysed than arms. Sensation clearly impaired (not lost) in both legs; also in arms, but perhaps less. No incontinence of urine or fæces, but some difficulty in micturition. To a moderate faradic current the tibiales antici contract. Abdomen and back muscles weak. Chokes on swallowing, but no return through nose. Talks in a whisper. No blue line on gums.

Ordered Tr. belladonn. ℥x. 6tis horis; brandy ʒiv.; chlorate of potash gargle; milk diet.

March 22.—Temperature rather higher, 99.5°.

March 23.—Temperature 100.5°; respirations 40; pulse 128, full and bounding. Sweats profusely. Otherwise not much changed. Does not wander in his mind. Cough troublesome when he swallows.

In the course of the day his swallowing became much worse; temperature still rose (101.8° before death). About 5 P.M. he became very restless; his breathing became more and more difficult, and he died about 9 P.M.

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*Post-mortem* about thirteen hours after death, the weather being warm.

No external appearances of decomposition, but some of the internal organs appeared softened (*v. infra*).

Cranial bones, dura mater, sinuses, &c., normal.

Arachnoid of convexity somewhat thickened and opaque; convolutions small; membranes separated from them with great ease. The membranes covering the interpeduncular space and fissures of Sylvius seemed decidedly thickened, but there was no sign of active meningitis. The carotids gaped on section, but otherwise there was no sign of arterial disease. Some general dusky discolouration of the brain, but no definite evidence of disease in it.

*Spinal cord.*—Little bubbles of air in arachnoid; slight general softening of cord, probably post-mortem.

*Larynx, trachea, and fauces.*—Normal.

*Lungs.*—Both œdematous; some slight adhesions of right pleura.

*Heart.*—Right ventricle: muscular wall very thin; cavity dilated. Left ventricle: muscle soft and not a good colour; some dilatation; valves normal.

*Aorta and vessels.*—Normal.

*Liver.*—Soft, easily torn; probably fatty.

*Spleen.*—Rather large; weight 10½ oz.; soft.

*Kidneys and other organs.*—Normal.

The following nerves were removed:—Left peroneal from head of tibia downwards to lower leg, with its branch to the extensor communis digitorum, and part of this same muscle; left ulnar from elbow to the middle of the forearm; both vagi from lower part of neck to their entry into the chest. Except that at one point the right vagus looked rather swollen and soft, all this nerve and muscle tissue appeared normal to the naked eye.

Microscopically the anterior tibial and peroneal nerves, which were prepared (*α*) with osmic acid, (*β*) with hardening in Müller's fluid and subsequent staining either with picro-carmine or the Weigert-Pal method, showed nothing abnormal. The muscular tissue of the extensor communis digitorum was also normal. About one vagus nerve (prepared with Müller's fluid, Weigert-Pal staining, and picro-carmine) there was some doubt; the medullated fibres appeared to take the Weigert stain badly, and to stain somewhat more with carmine than they ought to do. But I could not perceive any further evidence of disease, such as breaking up of the myeline, &c. The ulnar nerves were unfortunately lost.

As to the cord, in sections taken at tolerably frequent intervals,

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and stained with ($\alpha$) picro-carmine, ($\beta$) anilin blue-black, ($\gamma$) Weigert-Pal stain, I could find no abnormality.

I have nothing to add in the way of theory or explanation of these cases, and can only briefly summarise the facts. All agree in the salient fact of a progressive and fatal paralysis, for which no explanation could be found post-mortem. In all, the tendon-reflexes were absent. The reaction to faradism (in the cases tested) was normal. In Cases II. and IV. sensation was impaired, but this impairment was in no degree commensurate with the motor paralysis. In Case I. the upward march of the paralysis was very striking; in Case II. this upward spread is less clearly described (though, as far as my memory of the case goes, it existed). In Case IV. the arms appear to have been affected before the legs, but the history was somewhat uncertain, and the legs were worst after admission. Cases III. and IV. appear to have been somewhat slow in development; duration a month and three weeks respectively before admission. Case II. exhibited a typhoid condition, whereas the sensorium is said to be clear in Landry's disease. There appears also in this case to have been a more distinct retention of urine than is the rule.

In Case III. some sort of "fits" occurred previous to death.

As to causation, the first and typical case appeared to have direct relation to a prolonged chill: the dog-bite in earlier life may be noticed, but can scarcely be assigned as a cause. In Case II. no cause whatever could be discovered. The last two cases occurred in alcoholic subjects, and peripheral neuritis might therefore suggest itself, but this was excluded post-mortem.

The spleen was enlarged in Cases I. and II.; small in Case III.; rather large, weighing 10½ oz., in Case IV. Gastritis, with ulceration of the stomach and dilated heart, in Case III.; slighter cardiac dilatation in Case IV.; slight traces of obsolete phthisis in Case II.; practically no visceral disease (except enlarged spleen) in Case I.

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# CASES FROM SIR DYCE DUCKWORTH'S WARDS.

BY

F. E. A. COLBY.

## CASE I.

## A CASE OF THROMBOSIS OF THE SUPERIOR LONGITUDINAL SINUS.

COMPLICATED BY

1. *Congenital Morbus Cordis.* 2. *Cerebral Hæmorrhage*:—(1.) *Into Left Hemisphere;* (2.) *Subarachnoidal, with General Convulsions.* 3. *Irritation on the same Side as the Lesion.*

Samuel R., aged 10 months, was admitted on September 15. 1892, into Elizabeth Ward, under the care of Sir Dyce Duckworth, to whose kindness I am indebted for permission to publish the case.

He was a very fine well-nourished child, becoming markedly cyanosed when crying, the cyanosis being permanent on the tips of the fingers and toes. There was no clubbing. There were dilated veins in both eyelids and on the ends of the fingers.

A general systolic murmur was audible all over the cardiac area. He had a history of being "blue from birth."

Nothing happened of any consequence till September 22; in the evening of that day, the child having previously been playful, was said to have had a "fit," during which "his limbs were stiffened and eyes fixed for a few moments."

On September 26 he was taken suddenly ill at 5 P.M.; became very blue; respiration irregular with long pauses; seemed partially unconscious. Had more than one such attack.

On September 27, twitchings on the LEFT side of his face and jerking of the LEFT arm and leg coming on and going off. At 11.45 A.M., pulse 140, irregular; respiration very irregular; occasional sighing; is unconscious; pupils are small; occasional twitchings on left side of face and left arm. No vomiting; no squint.

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Examination of eyes showed much dilated vessels; discs of almost same tint as rest of retina, so that the margin was not very distinct.

Abdomen not retracted.

September 28.—Had general convulsions, now implicating the right as well as the left side of the body; all the limbs were at one time rigid.

September 29.—Is more conscious; looks about him; is very irritable; one slight general convulsion; was very rigid. Anterior fontanelle sometimes bulging, sometimes depressed.

September 30.—Very severe general convulsion; this evening, having previously been fed by nasal tube, took milk out of spoon. Fontanelle depressed after the fit.

October 2.—Convulsive state between 10 and 12 A.M.

October 3.—Conscious again.

October 4.—Better; takes food by the mouth, but very irritable. Took hold of stethoscope with his RIGHT hand.

October 5.—Became much worse; in a state of general convulsions, and died at 4 A.M. on October 6. Temperature at the time was sub-normal,

*Post-mortem examination.*

*Heart.*—1. Patent septum ventriculorum (at the base of the septum).

2. Small hole in the inter-auricular septum.

3. Pulmonary valves healthy. Pulmonary artery size of small quill.

*Brain.*—1. Thrombosis of the superior longitudinal sinus (clot adherent and friable), and of its tributaries from the cortex—the plugged veins looking like worms curling over the surface of the hemispheres.

2. Subarachnoidal hæmorrhage over nearly the whole of the LEFT hemisphere, and some on the right, behind the Rolandic fissure.

3. The whole of the LEFT hemisphere was scarcely anything more than a mere bag, inside which was some recent clot and a quantity of flaky whitish material, which was easily friable, and consisted either of broken-down blood-clot or of brain substance, probably the latter.

4. Both internal capsules were intact.

*Remarks.*—1. That possibly the heart disease with the mingled blood currents had been the primary cause of the thrombosis, though this can hardly be a very common event (there was no ear disease).

2. That (as Sir Dyce Duckworth suggested) the thrombosis of the sinus had led to rupture of its tributaries, and so caused

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the meningeal hæmorrhage; that those parts of the tributaries which lay between the gyri, being much distended, had ruptured into the ventricles.

3. That the reason why the child had lived so long, and without any apparent paralysis, might be explained in two ways: (1) That the onset was gradual, or (2) that in so young a child the cortex had not taken on its proper functions.

4. That the twitchings and convulsions were at first limited to the same side of the body as the lesion—that is, the left.

5. That two days before death the child grasped with its RIGHT hand a stethoscope, showing there was no paralysis on the right side at a time when the left hemisphere must have been considerably disorganised.

6. That the general convulsions that took place in the later stages were to be taken as an indication of general meningeal hæmorrhage, implicating both sides of the cortex. Another case of meningeal hæmorrhage has shown the same symptom.

7. That the oldest part of the lesion in the brain was apparently on the left side, and yet that the earliest signs of irritation were wholly confined to the left side of the body.

8. That both internal capsules were intact; had they been damaged, there would most likely have been some permanent paralysis.

9. That the child was one day very bad, and the next better again, is a curious fact. This happened on several occasions.

10. That on several occasions during the illness the temperature was considerably raised, and no cause could be found.

11. That this case shows that in thrombosis of the longitudinal sinus, the fontanelle may be either bulging or depressed.[1]

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## CASES II. AND III.

### GENERAL MENINGEAL SUBARACHNOID HÆMORRHAGE,

*Accompanied by Clot in the Fourth Ventricle, General Convulsions, Sugar in the Urine, and no Paralysis.*

CASE I.—A. B., 45 years old, was admitted into John Ward, under the care of Sir Dyce Duckworth, on October 7, 1892, suf-

[1] Instances of thrombosis of the cerebral sinuses are not at all common. Sir Dyce Duckworth has recorded two cases in the Clinical Society's Transactions for 1890, vol. xiii., and lays stress on the fact that hæmorrhage may occur in various parts of the brain as a consequence of the venous obstructions, and also on the occurrence of jerking movements of one or other side of the body.

See also Dr. Pitt's "Gulstonian Lectures" for 1890, and accounts by Von Dusch and Gerhardt.

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fering from slight right hemiplegia, with the history that at 9.15 P.M. on October 7, he suddenly fell forward without a cry, and remained unconscious, with stertorous breathing and insensitive corneæ, for fifty minutes. He had been notedly abstemious all his life. One week before admission he is said to have complained of an "attack of giddiness." Had never had a fit before. There was a strong family history of insanity.

*Condition on admission at* 11.30 P.M.—The patient looked much older than he was, pale and cold, with distinct loss of power on the right side, answering questions with difficulty, retching occasionally. Temperature 96.4°.

October 8.—The loss of power had considerably diminished, so that the patient could put his right hand on his head. The facial paralysis on the right side remained. There was nothing abnormal in connection with the eyes. There were signs of pulmonary emphysema, and, in addition, over the whole of the front of the left lung there were present medium-sized crepitations. None elsewhere. There was no lumbar œdema. There were signs of hypertrophy of the heart, with reduplication of the first sound at the apex, and accentuation of the second sound. The pulse was of plus tension. The radial arteries tortuous and palpable. The urine had a sp. gr. of 1012; contained a thick cloud of albumen and a trace of sugar. The patient on admission received the ordinary treatment for recent cerebral hæmorrhage. In the afternoon of October 8 he was seen by Sir Dyce Duckworth, who concluded that a small hæmorrhage had occurred somewhere in the brain, and that at least the hæmorrhage was not in the internal capsule, since the paralysis was not permanent.

October 9.—Had a restless night, wandering, speech thick. Patient not quite "collected." Sp. gr. of urine 1032; much more sugar. This was just before 4 P.M. At 4.25 P.M. the patient had a sudden epileptiform convulsion, beginning with a cry. Was generally convulsed. Urine was not passed, nor was the tongue bitten during the fit. Face and lips were blue. 4.30 P.M., another fit with cry. Temperature 99.2°. Other fits followed. 6.15, another fit; loud cry. Began on right side, afterwards general. Then followed at intervals of about twenty minutes in all fourteen fits, each lasting forty to seventy seconds, and implicating both sides of the body. There was no cry after the fifth fit. After the twelfth fit the temperature was 100.6°; pulse 144. This fit lasted longer, and the LEFT arm and LEFT leg remained convulsed after the right limbs had ceased to move. Corneæ were turned under the lower lids. Was obviously getting much worse. The thirteenth attack consisted of nothing more than two slight flexor spasms of the left fore-arm.

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The fourteenth and last fit took place at 9.8 P.M.

Just before, the temperature was 100.8°, and the pulse 168; once irregular. The convulsion was most marked on the *left* side. After the fit the pulse was intermittent; respiration failed, and death took place two minutes after all convulsive movements had ceased.

There was never at any time any rigidity, nor any obvious paralysis.

*Post-mortem.*—1. Subarachnoidal hæmorrhage all over both hemispheres, and extending to their bases.

2. A clot lying loose in the fourth ventricle; no destruction of tissue here. No blood in the aqueduct.

3. Left Sylvian artery had a small aneurysm on it; this had burst, and a small part of the brain in the region of the left inferior frontal convolution was destroyed along with the "face area;" circle of Willis atheromatous.

4. Hypertrophy of the heart and apparently healthy kidneys.

5. There was nothing in the left lung to account for the crepitation heard during life.

CASE II. was almost identical with Case I.

It was that of a man, H. B., aged 25 years, who on August 31, 1892, suddenly had a fit at 3.30 P.M. whilst at work. Never a fit before to-day. On admission some hours later, he had convulsive movements of both arms and legs. This was at 8 P.M.

His urine was drawn off; had a sp. gr. of 1032; contained a trace of albumen and abundance of sugar; temperature 101.8°.

There were several hæmorrhages in the left retina; none in the right.

9.30 P.M.—Had apparently been asleep. Had another fit. Tonic spasms of arms and legs, with irregular, choking breathing. Pupils were small, becoming unequal after the fit. The left arm remained rigid after the fit.

11 P.M.—Cheyne-Stokes respiration; then regular again. Tonic spasms of both arms; breathing became jerky and very infrequent. Pulse 200; very small.

He died shortly after 11 P.M. Just before death temperature was 104.2°; pulse 200.

*Post-mortem.* — 1. General meningeal hæmorrhage all over the surface of the brain.

2. Clot in the fourth ventricle. No blood in the aqueduct.

Dr. Ormerod thought the source of the hæmorrhage was a dilatation on the anterior communicating artery, which had burst.

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3. Extensive capillary hæmorrhage into the mucous membrane of the stomach.
4. Kidneys quite natural.
5. More than a dozen hæmorrhages into the left retina.

### Remarks.

These two cases of meningeal hæmorrhage are interesting as showing the same facts, namely, general convulsions; no paralysis; presence of sugar in the urine. It is well known that after almost any form of convulsion, arising from any cause, both albumen and sugar are apt to be found in the urine. So far there does not seem to be any satisfactory explanation of this occurrence. In such cases, too, the amount of sugar especially is generally only small. Now in the above cases there was considerably more than a trace of sugar in the urine—there was an abundance; and further, there was a possible cause for the appearance of this sugar, namely, a clot in the fourth ventricle. This clot may have caused the glycosuria by pressure on the diabetic centre in the medulla. The case of A. B. was diagnosed, during the occurrence of the fits, to be one of general meningeal hæmorrhage (whatever the lesion was which caused the original fit on October 7), mainly from the presence of general convulsions and the glycosuria. From these two cases, then, it would seem that during the progress of a subarachnoidal hæmorrhage there is a tendency for blood to find its way into the fourth ventricle (possibly through the foramen of Majendie) and so set up glycosuria. If this be so, then the occurrence of glycosuria in such cases may be an aid to diagnosis. It is hardly worth mentioning that the convulsions implicated both sides of the body, because both motor areas were irritated. It is interesting to note that in the case of A. B. there was never at any time any rigidity, though there was rigidity in Case II.

Both cases show how rises in temperature and pulse were indications of death.

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# CONCERNING TRACHEOTOMY.

BY

G. H. R. HOLDEN, M.D.

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I have chosen the above title for this paper, because in it I do not propose to give any new or startling facts or theories, but rather, plainly to set forth the main details of some thirty cases which were under my care whilst a resident officer to St. Bartholomew's and the General Hospital, Birmingham, and to emphasise those points which appear to me to be of the highest importance, as presenting the greatest difficulties to the newly appointed house-surgeon.

As to when tracheotomy should be done, is a question I will not touch on, except to repeat what has been many times said before, that if it is done in diphtheria *to save life*, it must be done early.

When the operation has to be performed, it is of the highest importance that the operator should have confidence in his instruments; for this reason I have always thought it best to have my own instruments in a separate case, so as to be personally responsible for their being in working order in cases of emergency.

In the case I have three Parker's tubes, sizes 28, 22, and 18, one two-bladed tracheotomy dilator, two pairs of pressure forceps, two aneurysm needles, a sharp hook, two knives, tape, and a few feathers. These instruments, together with the contents of an ordinary pocket dressing-case, are sufficient for all purposes. The blade of the knife should be 1⅝ inches in length, and the point should be central. I consider the latter most important, as with the point anywhere but central it is difficult to be absolutely certain where it is when the blade is partially imbedded in tissues. Important vessels are more likely to be unintentionally cut by a knife with a point in line with the back, and having, consequently, a prominent belly, than with one with a central point. It is needless to mention the absolute necessity of having a knife as sharp as possible, for cutting

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through the rings of the trachea is always difficult with a blunt knife. The sharp hook should be strong, with a short wide curve.

So much for the instruments. The next question that arises is whether or not chloroform should be given. In all my cases, except four, it was given, and in those it was unnecessary, as the patients were unconscious or at most semi-conscious. From what I have seen, I believe that, with few exceptions, it is safer to give chloroform than withhold it, as it diminishes struggling and so makes the breathing easier, and by lowering blood-pressure prevents excessive hæmorrhage. It is not necessary, however, to continue the administration after the beginning of the operation.

In most cases the high operation is best. The incision should be free, as more danger is likely to arise from a too small than from a too large incision. I have more than once seen subcutaneous emphysema occur where the skin incision has been too small.

Throughout the operation, bold though careful cutting is preferable to either separation of the tissues with a director or mere scratching with the knife-point, as both these practices are unsurgical, and take up an unnecessary amount of time without giving increased safety.

The question of the use of retractors is important. My practice has always been this: if I had a third assistant, whom I could implicitly trust, I used a pair of aneurysm needles, putting them *myself* into the required position, and telling the assistant to hold them in that position. In the absence of such an assistant, it is not only no help to use retractors, but is even a danger. A careless assistant may draw the trachea to one side, and from this cause I have seen several serious accidents occur.

When the isthmus of the thyroid gland appears in the high operation, the question arises as to how to deal with it. Some surgeons divide it, but I have never been able to see the utility of this proceeding. By dividing the fascia attaching it to the cricoid cartilage, by a transverse incision along the lower edge of the cartilage (as recommended in some text-books), no difficulty will be experienced in drawing down the isthmus with an aneurysm needle to the required extent. In none of my cases was it necessary to divide the isthmus. There can be no doubt that division of the isthmus increases the hæmorrhage considerably.

The trachea being exposed, it is convenient to fix it by introducing a sharp hook under the lower edge of the cricoid cartilage

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on the right side (*i.e.*, on the operator's left); then, holding the sharp hook with the left hand, introduce the point of the knife between the first and second rings, and with a careful stabbing and drawing action of the right hand and wrist divide the second and third rings *from above downwards* in the middle line. Then, with the knife still in the wound, introduce the dilators, withdraw the knife, separate the blades of the dilators, and with the knife divide the first ring upwards, and, if necessary, enlarge the incision in the trachea downwards. This incision also should be free, so as to enable the tube to be easily introduced, without risk of buckling in the cut edges of the trachea. (I have put "from above downwards" in italics, as it will appear to many to be heretical; yet, in the high operation, it seems to me more convenient and more easy of performance than cutting from below upwards, and quite free from risk when ordinary care is used.) The method of introducing the dilators first, and then enlarging the incision, I have found most useful.

With regard to the tube, I always use Parker's pattern, for the following reasons:—

1. The curve of the tube and the moveable guard enable the tube to lie in the trachea comfortably, occupying the lumen accurately, and preventing excoriation of the mucous membrane (which is an almost necessary consequence of the use of the ordinary bivalve quarter-circle tube).

2. The silver tube can be worn as long as a tube is necessary.

3. I have found that membrane is more readily expelled through a Parker's tube than through any other.

The easiest method of introducing a Parker's tube is, standing on the right side of the patient with the dilators in the left hand, to take the tube in the right hand, with the external opening pointing to the right side of the patient, then introduce the end of the tube into the trachea, and with a kind of twist or *tour de maître*, bring the tube into position. By this manœuvre all difficulty of introducing the tube is overcome, provided that an efficient opening has been made in the trachea.

I have been led to discard the use of rubber tubes in the after-treatment for the following reasons:—

1. The necessary thickness of the material causes the diameter of the lumen of the tube to be too small as compared with its entire diameter.

2. The nature of the material causes mucus, &c., to stick to the inside of the tube, and so to further diminish the size of the lumen.

3. Damage is frequently done to the tissues round the wound by the amount of force sometimes necessary to overcome the

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difficulty experienced, in the first two or three introductions of the rubber tube.

4. Experience has shown that a Parker's tube may be worn for months, without doing damage to the trachea.

I have not mentioned such points as the necessity of stopping hæmorrhage from cut vessels, of large size, during the operation, as every one is agreed as to them.

*After-treatment.*—By some I shall again be thought heretical, for not advocating the use of the "steam tent," as a routine practice. It is my belief that in most cases, where a warm atmosphere free from draughts is obtainable, that the "steam tent" is worse than useless, and in some cases of children, reduced by weakness to almost the "last gasp," it may actually turn the scale against them. What I like to use is a thin, coarse, flat sponge, wrung out of warm water, and placed over the opening of the tube, and changed frequently for the first twenty-four hours, after which, with a warm atmosphere, the tube may be left with a covering of folded plain gauze.

Spraying the trachea through the tube with warm boracic acid lotion or solution of bicarbonate of soda assists the separation of the membrane and its ejection; but I have always been loth to intrust this treatment to a nurse, as it requires to be done with great care and judgment.

Feeding with the nose-tube should be avoided, unless it is absolutely necessary.

Feathering the tube, again, should be done with carè and judgment, and not officiously or too often.

In a case of diphtheria it is generally necessary to take out the inner tube for cleaning about once every two hours, while membrane is being coughed up; but, as a routine, it is not necessary, when a "Parker" is used, to remove the outer tube more than once in two days.

The treatment of the wound is generally simple, and nothing but some lint spread with ung. acidi borici is necessary. In children, however, who are in feeble health, the edges of the wound ulcerate away, presenting a clean shiny appearance, and the wound may become of large size. The prognosis, however, is good, and as the health improves the ulceration stops, and healing takes place with comparatively little scarring. The best treatment in these cases is: internally, a nourishing diet, with full allowance of stimulants, and a mixture of carbonate of ammonia and bark; and, locally, dusting with iodoform.

The tube should be removed as early as possible in all cases, as the longer it is worn, the more difficult it will be for the

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patient to breathe *per vias naturales*, when it is removed. The tube should not, however, be removed, except for cleansing, when the patient's temperature is much raised from lung complications or other cause; in these cases the removal of the tube causes distress and anxiety to the patient, and for that reason may seriously affect the issue. Again, while membrane is still being coughed up, it is not wise to attempt to permanently remove the tube.

Sometimes there is much difficulty in removing the tube, as the patient seems to lose the power of co-ordination in his laryngeal muscles, and they do not work at first in an orderly manner with the other respiratory muscles. This condition is often troublesome, but is usually only temporary. Greater difficulty is experienced in cases where cicatrisation occurs in the region of the cords, and stenosis of the larynx follows. I have seen two cases in which the introduction of an intubation-cannula caused ulceration, and subsequent diminution of the lumen of the larynx to such an extent that the permanent use of a tracheotomy tube was necessary.

The following table comprises all the cases I have myself operated on, and I publish them as typical examples of the class of cases that a resident surgeon may expect to be called upon to deal with.



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*Table of Thirty Cases requiring Tracheotomy.*

| Diagnosis. | Age. | Sex. | Duration of Disease at Time of Operation. | Date of Removal of Tube after Operation. | Complications. | Result. | Date of Death or of Leaving Hospital after Operation. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1. Diphtheria. | 4 | M. | 6 days. | Fourth day. | Scarlatina. | R. | Forty-third day. | Amount of membrane coughed up exceptionally great, including entire cast of one bronchus. Scarlatina supervened during convalescence. |
| 2. Diphtheria. | 8 | F. | 4 days. | ... | Nasal diphtheria. | D. | Fourth day. | Died from virulence of disease. Breathing unobstructed after operation. |
| 3. Diphtheria. | 2½ | M. | 5 days. | ... | Nasal diphtheria. | D. | Third day. | Severe hæmorrhage from nose. Died from virulence of disease. |
| 4. Diphtheria. | 3 | F. | 4 days? | Second day for four hours. | Double pneumonia. | D. | Fourth day. | Breathing free after operation. Measles fourteen days before operation. |
| 5. Diphtheria. | 1 3/12 | F. | 1½ days. | ... | ... | D. | Third day. | ... |
| 6. Diphtheria. | 2½ | F. | 7 days. | Fifth day, eleven hours. Eighth day, twelve hours. Ninth day, permanently. | Bronchitis. | R. | Thirty-fourth day. | Wound healed on twenty-first day. Measles two months before operation. |
| 7. Diphtheria. | 2½ | M. | 12 days? | ... | ... | D. | Second day. | Measles, Sept. 5th. Discharge from nostrils, Sept. 7th. Throat "looked suspicious," and fœtid discharge from nostrils, Sept. 9th. Operation, Sept. 21st. |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8. Diphtheria. | 16 mos. | F. | 3 days. | ... | ... | D. | Third day. | Measles two months ago. Condition very bad on admission. Breathing stopped during operation, but restored by artificial respiration. |
| 9. Diphtheria. | 3 | F. | 3 days. | Seventh day. | Ulceration of wound. | R. | ... | Wound ulcerated for about nine or ten days, but afterwards healed well under stimulating general treatment, and dusting with iodoform locally. |
| 10. Diphtheria. | 5½ | F. | 4 days. | ... | ... | D. | Third day. | Admitted in moribund state, operation done in surgery without anæsthetic. Membrane in bronchi. |
| 11. Diphtheria. | 1½ | F. | 7 days. | ... | Broncho pneumonia. | D. | Second day. | ... |
| 12. Diphtheria. | 14 mos. | M. | 5 days. | ... | ... | D. | Fifth day. | Membrane down to smallest bronchi. |
| 13. Diphtheria. | 6 | F. | 9 days. | ... | Nephritis. Bronchitis. | D. | Fifteenth day. | Tube could not be left out at all. |
| 14. Diphtheria. | 3 | F. | 2 days. | ... | Bronchitis. | D. | Sixth day. | Blood-stained discharge from nose two days after operation. |
| 15. Diphtheria. | 2½ | F. | ? | ... | Broncho pneumonia. | D. | Two hours after operation. | Operation done as "forlorn hope." |

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*Table of Thirty Cases requiring Tracheotomy—(continued).*

| Diagnosis. | Age. | Sex. | Duration of Disease at Time of Operation. | Date of Removal of Tube after Operation. | Complications. | Result. | Date of Death or of Leaving Hospital after Operation. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 16. Diphtheria. | 6 | F. | 2 days. | ... | ... | D. | Second day. | Death from sudden hæmorrhage from wound. Source of hæmorrhage not discovered at P.M. Hæmorrhage at time of operation was slight. |
| 17. "Membranous laryngitis." | 10 mos. | F. | ? | Third day, for short time, but had to be put back. | Capillary bronchitis. | D. | Sixth day. | ... |
| 18. "Membranous laryngitis." | 2½ | F. | "Feverishcold" 8 days. "Croup" 1 day. | ... | Broncho pneumonia. | D. | Third day. | Membrane extended into minute ramifications of bronchi. |
| 19. "Membranous laryngitis." | 2 | M. | 2 days. | ... | Broncho pneumonia. | D. | Third day. | Membrane from base of epiglottis to smaller bronchioles. |
| 20. "Membranous laryngitis." | 1 | M. | ? | ... | ... | D. | Sixth day. | (No P.M. notes kept.) |
| 21. "Croup"—Whooping-cough. | 7 | F. | Croup 3 days. | Fourth day. | ... | R. | Thirty-second day. | "Has had bronchitis since birth." |
| 22. "Croup." | 6 | F. | 14 days. | ? | ... | R. | Twenty-ninth day. | Notes not obtainable. |
| 23. "Croup." | 1 1/12 | F. | 1 day. | ... | Broncho pneumonia. | D. | Third day. | No membrane present. Lower lobes of both lungs consolidated. |

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|---|---|---|---|---|---|---|---|---|
| 24. "Croup." | ? 6 | F. | 2 days. | See remarks. | ... | R. | ... | Operation performed while rash of measles was present. No membrane seen. Tube could not be left out. Intubation performed twice about a month after operation with no permanent good result. Was wearing tube eighteen months after operation. |
| 25. Syphilitic disease of larynx. | 13 | M. | 14 days. | 8 months (about). | ... | R. | Twelve months. | A very bad case of congenital syphilis. Syphilitic disease of larynx came on after patient had been taking iodide of potassium in the Hospital for a month. Disease ultimately cleared up and tube was left out. Pot. iod. was continued after operation with excellent results. |
| 26. Angina Ludovici. | 29 | M. | 2 days. | ... | Nephritis. Convulsions. Coma. | D. | Eight hours after operation. | Patient walked to ward, with swelling of neck, and temp. 102° F. at 12.30 P.M. Rapid œdema of glottis at 1.20 P.M., immediate tracheotomy. Wound gangrenous in six hours. |
| 27. Angina Ludovici. | 32 | M. | 1½ days. | ... | ... | D. | Immediately after operation. | Rapid œdema of glottis, tracheotomy, death followed immediately, apparently from the acute blood-poisoning. |

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*Table of Thirty Cases requiring Tracheotomy—(continued).*

| Diagnosis. | Age. | Sex. | Duration of Disease at Time of Operation. | Date of Removal of Tube after Operation. | Complications. | Result. | Date of Death or of Leaving Hospital after Operation. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 28. Fracture of base of skull, hæmorrhage into pharynx and larynx | 19 | M. | ½ hour. | ... | ... | D. | Five minutes after operation. | No external signs of fracture. Sudden, severe dyspnœa, tracheotomy, about three ounces of blood evacuated. Death from suffocation by blood in small tubes. |
| 29. Inhalation of vomited matter under chloroform. | 10 | F | ... | ... | ... | D. | Immediate. | Chloroform administered to set compound fracture of thigh. While recovering from anæsthetic, patient tried to vomit. Sudden dyspnœa. Tracheotomy and artificial respiration with inversion. Some fluid and semi-fluid matters evacuated. P.M. smaller, bronchi found filled with semi-digested semi-fluid matter. |
| 30. Foreign body in larynx. | 14 mos. | M. | 25 hours. | After 6 hours. | ... | R. | Twenty-first day. | Dress-hook impacted between vocal cords. Tracheotomy. Cricoid cartilage divided. Hook removed. (For full Report see *British Medical Journal*, March 12, 1892.) |

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# CIRRHOSIS OF THE LIVER

## IN A GIRL OF ELEVEN YEARS.

BY

ARTHUR J. HALL, M.B.

H. C., a girl aged 11 years, was admitted into the Sheffield Public Hospital under my care on November 17, 1891, suffering from considerable ascites, with a large tumour on the left side of the abdomen. The history was as follows:—

Three years ago she felt pain in the right side of the body, for which she was taken to a doctor, who said it was her liver, and treated her for it. The pain remained for some time, and in the early summer of 1891 the body began to swell, and she had some diarrhœa. She was about this time seen by my colleague, Mr. Pye Smith, in consultation with their regular medical man, and I am indebted to the former for her further history. The liver edge could not then be felt, nor was any tumour felt on the left side until the ascites had existed for some time.

The abdomen was tapped first about the end of August 1891, and one gallon of fluid drawn off; again early in September, when one and a half gallons were removed; and after this it was twice tapped before admission, the last time being on November 12, five days before admission.

*Family history.*—Mother dead. Eldest of five children, so far quite healthy. Had never taken any alcohol previous to her illness this summer. (On this point there can be no doubt, as her parents were very respectable, honest people, and they assured us that it was so.)

*Condition on admission.*—(For these notes I am indebted to my clinical clerk, Mr. C. W. Branson.)—Pale and anæmic; skin dusky; teeth showed arrested development; alæ nasi dilate on inspiration; respirations very shallow, 36 per minute; heart's apex-beat, fourth space, one inch outside nipple-line; irregular

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and jerky; superficial veins of thorax and abdomen distended, especially on the right side; cardiac dulness up to third rib down to fourth space, where pulsation is also felt close to the sternum.

The chest unduly resonant over back and front; the breathing puerile.

Liver dulness reaches to fifth rib in nipple-line, sixth space in axilla, seventh rib behind.

On left side dulness up to seventh rib in mid-axillary line.

*Abdomen.*—Greatly distended; 34½ inches transversely through umbilicus; 35½ inches at point midway between umbilicus and xiphoid cartilage. Absolute dulness over front and sides except small area in epigastric region. On the left side a lump is felt, covered by a thin layer of fluid; it is hard, firm, and smooth, with distinct rounded border, extending forwards a little beyond the left nipple-line and downwards to close above the left iliac crest. It is moveable, and extends up to the edge of the ribs, where the dulness is continued up to the seventh rib in the mid-axillary line.

Feet and legs œdematous.

There has been diarrhœa since admission, which has prevented any specimen of urine being obtained for examination.

Temperature last night was 100.4°.

November 20.—Paracentesis abdominis performed to-day; ten pints eighteen ounces of clear yellow fluid being drawn off, and the symptoms much relieved.

November 23.—On examining the abdomen to-day, the tumour was distinctly felt to be a greatly enlarged spleen, the edge and notch being quite diagnostic. Since the paracentesis another important fact has been made clear: the liver dulness is considerably diminished, extending in front merely from the fourth to fifth space, in the axilla from the seventh to ninth rib, while behind there is dulness up to the seventh rib. The patient complained last night of some pain over the right base behind, and on examination there is a loud coarse friction sound and fremitus over the ninth right space behind for a hand's breadth. It is the loudest friction sound I ever heard. There is slight leakage from the abdominal wound.

November 26.—Diarrhœa has stopped, and the urine is orange coloured, with sp. gr. 1023 and a cloud of albumen. Abdomen is fast refilling.

November 29.—The little patient complained of pain in the abdomen this afternoon, which was followed by vomiting. She recovered for a little while, but soon after the pain returned, and she died quietly at 4.30 P.M.

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*Autopsy*, made November 30th.—Abdomen much distended with fluid; body emaciated. Superficial veins purple and clear, the skin discoloured around them, although only twenty-four hours after death, and the weather frosty.

The abdomen contained a large quantity of clear yellow fluid. The liver was felt to be situated high up under the ribs, very small and nodular. On removal, it presented a very peculiar appearance (Fig. 1). It measured 8 inches from side to side. *The right lobe* appeared as a rounded mass covered with knobs of a bright scarlet colour containing small purple spots in them, having the general appearance of a large strawberry. It measured 5½ inches broad by 5 inches in depth. The inferior margin presented a thin sharp margin about half

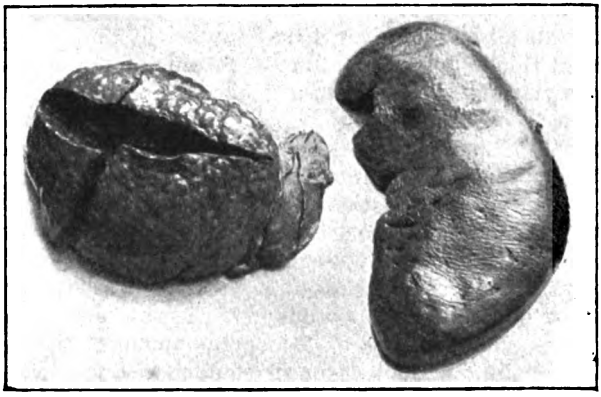

FIG. 1.—Liver, showing left lobe much atrophied. Right lobe hob-nailed.

FIG. 2.—Spleen.

an inch wide of healthy smooth liver substance. *The left lobe* was extremely atrophied, but presented a smooth normal surface and thin edge, except on its upper surface, where there was a single nodule similar to those in the right lobe. It measured 2½ inches broad by 3 inches deep.

The portal vein was clear, large, and patent.

*The Spleen* (Fig. 2), 9 inches long by 4½ broad, the notch being 2 inches from the lower border. It was firm, slate-coloured, and showed a congested condition on cutting into.

*Stomach and intestines* were normal.

*Pancreas* somewhat firmer than usual.

*Mesenteric glands* enlarged and harder than usual, especially in the neighbourhood of the portal vein.

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*Kidneys* large, congested; capsule not adherent.

*Heart* small, atrophied; the mitral valve presenting a few granules on its surface.

*Lungs* soft and compressed in parts; a patch of recent pleurisy at the right base behind.

*Brain.*—The surface and sections appeared normal to the naked eye.

*Thyroid* somewhat enlarged.

*Axillary and inguinal glands* felt somewhat hard and enlarged.

*Microscopical pathology.*—Specimens of the liver, pancreas, mesenteric glands, inguinal glands, spleen, and suprarenal capsules were preserved in Müller's fluid, followed by spirit. The sections were stained in Kleinenberg's hæmatoxylin, and mounted in the usual way.

As regards all but the liver, I may say briefly that, except for some slight thickening of the fibrous capsule of the spleen and lymphatic glands, together with a good deal of hæmorrhage in the spleen, I could find nothing abnormal, save perhaps the fact that they stained with some difficulty. The suprarenals and pancreas seemed quite normal.

*Liver.*—I prepared a section through the surface at one edge, including the smooth portion mentioned above, and the nodular portion, which did not quite reach the thin edge.

The capsule is much thickened, and contains a large amount of blood; it is composed of fibrous tissue in the form of spindle cells, with a great number of leucocytes amongst them, these especially forming a thick layer in contact with the liver cells. The trabeculæ of fibrous tissue are well seen (Fig. 3) in the micro-photograph, kindly taken by Dr. Ruxton, passing from the capsule between the lobules. They show a similar condition to the capsule, the leucocytes on each side next to the lobules being in a thick layer, which penetrates more or less between and amongst the cells of the lobules, sometimes passing in for a considerable distance. As regards the lobules themselves, the cells at the centre are of a natural size and appearance, but as the outer part of the lobules is approached they become larger, the nuclei also being increased, sometimes very considerably in size. The cells contain frequently two nuclei, close together or sometimes more. Some of these larger swollen cells contain granular material, which appears of a yellowish colour, and others are swollen out with a globule of fat, whilst here and there the cells have been completely transformed into fat cells. This is very well shown in those cells more immediately in contact with the leucocytes of the fibrous trabeculæ.

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The piece of liver at the edge in which no nodules are situated is quite different from the above. The capsule is not thickened, but the liver substance is filled with a mass of leucocytes and patches of red corpuscles, whilst there is no trace left of liver cells.

The condition of the liver, then, differs from the ordinary structure of cirrhotic livers in the fact that instead of well-formed fibrous trabeculæ there is an undeveloped condition of rapidly growing spindle cells, with a great quantity of leucocytes. I would couple this fact with the rapidity of death after symptoms set in, the severity of the symptoms, the enlargement of the

FIG. 3.—Section through right lobe of liver, showing very thick capsule of Glisson, with two well-marked trabeculæ of fibrous tissue. (From micro-photo by Dr. W. L. Ruxton.)

lymphatic glands, and the increased number of leucocytes in the blood.

*Remarks.*—This case, I think, presents many points of interest both clinically and pathologically.

1. There is a distinct and definite history of no alcohol having been taken, as in the two cases recorded by Mr. Jollye,[1] and the case by Dr. Tidey,[2] and many other cases recorded.

2. The sudden appearance of symptoms due to disease of the liver, and fatal termination in six months, although there was

[1] Brit. Med. Journ., p. 858, April 1892. [2] Ibid., p. 125, July 1892.

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a history of pain over the region of the liver three years previously, and lasting for a long time.

3. The presence of enlarged glands of the mesentery, groin, and axilla, together with pleurisy, as in cases reported by Dr. Cayley[1] and Dr. Pye Smith,[2] perhaps points to some general disease of the lymphatic system.

4. The atrophy of the left lobe of the liver, with only one nodule in it of cirrhosis.

I have read with much pleasure Dr. Ormerod's excellent paper of a case of cirrhosis in a child with nervous symptoms.[3] In my case there were no nervous symptoms at all, and the brain, to the naked eye, showed no degenerations such as he described.

It will be interesting to watch the younger members of the family of this case to see if any should develop similar symptoms to this patient; though even should they do so, I fear the result of experience in the case I have recorded will not point out any particular line of treatment or method of preventing its fatal progress.

I may add that on two occasions I examined the blood with the hæmacytometer. On November 23rd the proportion of white corpuscles to red was 1 to 200; on the 24th it was 1 white to 75 red, so that the proportion of white was considerably greater than normal. Unfortunately, her sudden death prevented more extended observations.

[1] Trans. Path. Soc., vol. xxvii. p. 194. [2] Ibid., vol. xxxiii. p. 172.
[3] St. Bartholomew's Hospital Reports, vol. xxvi.

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# THE

# ÆTIOLOGY OF CROUPOUS PNEUMONIA.

BY

E. CAUTLEY, M.B.

---

This paper records the observations and deductions therefrom made on eleven cases of croupous pneumonia from a bacteriological point of view. My object has not been either to prove or disprove any bacterial or other theory of the origin of this disease, but merely to collect the facts and see then whether any conclusions may be reasonably drawn from them. The cases have been taken haphazard from the post-mortem room at times when I have had sufficient leisure to devote to the work; they have not been in any way selected. Only those cases were neglected which gave olfactory signs of commencing decomposition.

First of all it seems wise to consider whether there was anything in the history of the patient, or whether there were any concomitant deviations from perfect health which would account for the pneumonia proving fatal. Almost with certainty it may be deemed sufficient reason in one case that the patient was 62, and broken down in constitution. In another, the presence of chronic interstitial nephritis; and in still another, this same disease, associated moreover with gout, was undoubtedly a most important factor. These patients were aged 40 and 44.

The average age of the remaining eight is only 26, the range being from 19 to 34. Naturally we expect to find something more than simple croupous pneumonia of one lobe to account for death occurring at such a comparatively early age. Well, in the last three cases recorded, the weakened vitality of the body resulting from alcoholism was undoubtedly the predisposing cause. In Case VIII. pericarditis, peritonitis, and general congestion of the lungs were sufficient, even independently of an antecedent history of syphilis and malaria. Another case was complicated by advanced disease of the suprarenals, although

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no evidence of it was noted during life. The remaining three patients had each two lobes involved; in addition, one was complicated by jaundice and vomiting, and another by severe and continuous diarrhœa.

Hence in every single case the fatal termination may be reasonably ascribed to one or other, in some cases more than one, of the causes usually assigned as leading to death in pneumonia, namely, old age, alcohol, involvement of more than one lobe, some other affection of the remainder of the lung, or the presence of some chronic disease interfering with nutrition.

Turning now to the bacteriological side of the question. It is frequently stated that croupous pneumonia is of the nature of a specific fever. If such be the case, we should expect to find some micro-organism giving rise to the disease. In some cases this expectation has been verified; notably so on those occasions when pneumonia has occurred in epidemic form. An epidemic occurred on a very large scale in and around Middlesbrough a few years ago. On investigation of numerous cases, Dr. Klein found a specific organism, a bacillus, present in the lungs, in the alveolar secretion, and the blood-vessels, and productive of pneumonic congestion of the lungs when injected into animals, notably mice. The cases were investigated by Dr. Ballard in Middlesbrough, and their clinical history and pathology are ably described by him in the Report of the medical officer of the Local Government Board, 1889. The bacteriological investigations were carried out by Dr. Klein and appear in the same report.

On comparing these cases with ordinary cases of croupous pneumonia, only slight differences are noticed. The main characteristics of the outbreak were that it occurred among people living under the same conditions; that the symptoms, clinical course, and pathology, were very much alike in all cases, and also that it was distinctly infective, spreading in the same household from one person to another.

Thus in one series of cases there was undoubtedly a specific bacillary origin. In addition to this a few other observations must be referred to. Friedländer and Frobenius[1] found in the alveolar secretion, and isolated by cultivation, a short bacillus, characterised by a capsule and by its often assuming the form of a diplococcus. This bacillus of Friedländer, when it occurs, appears in the stage of red hepatisation, and disappears during the further stage. This micro-organism was also present in the sputum. It was fatal to mice, and produced pneumonic

[1] Forts. d. Med., vol. i., 1883, No. 22.

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consolidation of the lung in them, but this result was only obtained by inoculation into the pleural cavity and lung-tissue, considerable damage to tissue being done by the operation. Subcutaneous injection produced no pathogenic result.

On referring to the Local Government Reports of 1884, I find a paper by Dr. Klein on this subject. There he points out that these pneumococci, or bacilli of Friedländer, as they are better called, are never present in the lung-tissue or in the blood-vessels; that their number is too insignificant to justify the assumption of a causal relationship; that the earlier the stage of the disease the fewer the micrococci; that their cultivations on solid media are not diagnostic; that their experiments on animals were accompanied by so much mechanical injury to the lungs as to make them valueless. And, in conclusion, he regarded them as a septicæmic organism only accidentally present.

Sternberg of Baltimore published about the same time a paper in which he proved that the micrococci of human saliva, which sometimes produce septicæmia in rabbits, are identical with Friedländer's organism. Passet has shown that an organism identical in every respect with Friedländer's bacillus occurs independently of croupous pneumonia; that it is, in fact, probably a normal inhabitant of the throat and mouth, and is present in the normal sputum. A. Fränkel[1] and Weichselbaum[2] have shown independently that this bacillus is present in only a small percentage of cases during the stage of red hepatisation.

The two latter observers have also described an oval capsulated coccus, which they say is almost invariably present in large numbers in the sputum and lung-juice. The cocci are usually arranged as diplococci. Cultures inoculated subcutaneously, or, better still, intra-peritoneally, produced in mice and rabbits a general septicæmic infection.

The diplococcus pneumoniæ of Fränkel and Weichselbaum has been found also in acute purulent otitis, cerebro-spinal meningitis, and acute peritonitis.

Weichselbaum,[3] in the sputum of twenty-one cases of bronchitis after influenza, found it constantly present in considerable numbers; yet in only two or three cases did pneumonia supervene. Besser[4] found it in the normal nasal secretion in fourteen out of eighty-one cases, in many instances so numerously as to form a pure culture.

Finally, Newmann[5] points out that the micrococcus pyogenes

[1] Deutsche med. Wochenschrift, 1885, No. 31.
[2] Wiener med. Jahrbucher, 1886, p. 483.
[3] Wiener med. Blätter, xiii. No. 6.
[4] Ziegler's Beitrage zur path. Anat., Band vi. 4.
[5] Centralb. für Bacteriologie und Parasit., vii. No. 6.

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tenuis of Rosenbach, which occurs in numerous purulent processes, is identical with the diplococcus pneumoniæ. Finkler[1] summarises all the observations made as follows:—

1. Fibrinous pneumonias are caused particularly by the diplococcus pneumoniæ.

2. Broncho-pneumonias are bacteriologically not a single disease.

3. Cellular pneumonias are caused chiefly by streptococci.

Referring now to my own observations, I note a good many different micro-organisms. In the first case there was a single variety of micro-organisms, namely, a bacillus. It was found in the lung-juice. It, and it only, grew on cultivation, and on section it was found in the alveolar exudation.

This organism is Klein's bacillus pneumoniæ, and it is worthy of remark that it was not present in any other case. Probably, however, the bacillus found in the sixth case was some close connection of this; in many respects it was the same, but it differed in its much more rapid growth; possibly it was the same. Now, in examining sections of the lung in this first case, it is very noticeable that large numbers of the alveoli contain exudation entirely free from bacilli, and that where the bacilli are present in alveolar exudation they are present in large numbers. They are also conspicuously absent from the alveolar walls and from the blood-vessels. All these facts are strongly in favour of the view that the bacilli happened to become entangled in the lung at the commencement of the disease, possibly from being predominant in the air the patient was breathing at that time, and that they found in the alveolar exudation a nutrient medium peculiarly suitable for their development. We should therefore have to regard them as a sequence, not a cause. But in spite of this, even if they are not the cause, they may still be of importance. It is probably greatly to a patient's detriment that, in addition to the acute inflammatory process which he has to contend against, he should have also to wage war against bacteria and their products, deleterious or not as the case may be. Thus the study of these organisms is probably important, not from an ætiological point of view, but from a therapeutical one.

On the other hand, if we judge by what occurred during the Middlesbrough epidemic, we are forced to the conclusion that Klein's bacillus pneumoniæ was in no sense secondary, but that it was indeed the primary exciting cause of the epidemic.

In another case the organism proteus vulgaris was alone

[1] Die acuten Lungenentzündungen als Infections-Krankheiten. Wiesbaden, 1891.

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recovered, although cocci, arranged as diplococci and short chains, were found in cover-glass preparations of the lung-juice.

Indeed, in every case except one, similar cocci were found arranged as diplococci, and occasionally in short chains. Capsules were conspicuous by their absence; possibly some might have been demonstrated by different methods of staining. Only in a few was there any suspicion of capsules being present. In those cases where special staining was adopted to demonstrate the capsules, none were distinctly demonstrated. Now all these different cocci turned out to be some kind of staphylococcus or streptococcus. Staphylococcus aureus was the most common. Staphylococcus albus was present in one case, and in another an organism similar to it in every respect apparently, except that it did not liquefy gelatine.

Streptococcus pyogenes was present in several cases. For the description of the different organisms, refer to the accounts of the cases farther on. Also the experimental work on animals practically yielded no result of any value.

What conclusions then do I deduce from all these different facts and observations?

*Firstly*, it is obvious that there is no one single species of organism present in every case of pneumonia; at any rate, no organism which is discoverable by our present means of cultivation and microscopical examination, to which we can ascribe a causative power in the production of the disease. If this disease is bacteriological in origin, there must be numerous varieties of micro-organisms which give rise to it.

*Secondly*, I would ask if there is any evidence that any cultivation of any micro-organism has ever produced typical croupous pneumonia in any animal? My own results are certainly negative. Klein, using the bacillus pneumoniæ, got positive results, but he was dealing with an organism which produced a disease better called pneumonic fever, as it differed in so many respects from the simple croupous pneumonia.

*Thirdly*, Cannot the presence of micro-organisms in the lung be regarded in most cases as a sequel, and not as a cause? It is very noticeable in every case I have examined, that in not a single one are micro-organisms present in any other part of the lung than the alveoli and air-passages. They are not found in the alveolar wall nor in the blood-vessels.

In some cases, it is important to note, organisms were found in cover-glass preparations of the lung-juice which were not recovered by cultivation.

Perhaps the explanation depends upon the stage of the



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disease at which the observations were carried out. It is quite reasonable to suppose that the organism which gives rise to the pneumonia lives only a few days, or even a few hours; if that be so, then the organisms found in cover-glass preparations, and not grown by cultivation, may be simply dead ones which have been destroyed by the height of the temperature or the other conditions, of which we as yet know so little, which put a term to the life of micro-organisms in the tissues. They may, in fact, in those cases be the organism producing the pneumonia, while those actually recovered may be merely of secondary importance.

*Fourthly*, I think that on the whole my observations *prove* that no single species of organism gives rise to acute croupous pneumonia. If, indeed, micro-organisms are causative, then we must hold that several different species or varieties are responsible.

Case I.—W. S., aged 19, was admitted on June 17, 1891, with a temperature of 103.6°, which rose shortly to 105.4°.

Illness commenced on June 14 with cold shivers and no pain. Had a cough for three days before. No previous illness. No history pointing to phthisis. He was pale and a little jaundiced. Pulse 128; respiration 36.

Viscid, slightly rusty, copious sputa. Physical signs of consolidation over right side in front from third rib to base, also in axilla; behind the breath sounds were feeble over the lower lobe.

June 18.—Temperature was reduced by antipyrin during the night, but has again risen. Increased signs of consolidation in the axilla.

June 19.—Sleeplessness and delirium. More jaundice and some hepatic tenderness. Vomiting. No bronchial breathing behind.

June 20.—Increased jaundice. Bright green vomit. Signs of consolidation at angle of right scapula and over left lower lobe behind.

June 21.—More jaundice and more vomiting. Died at night.

Temperature ranged between 102° and 105.4°, generally between 102° and 104°. Except when reduced by antipyrin it looked like an ordinary temperature of croupous pneumonia. Respiration 54–80; pulse 124–144.

*Post-mortem* on June 23.—Red hepatisation of base of left lung and of right lung between apex and base. At one apex there were puckering, adhesions, and some old calcified masses, almost certainly due to old tubercular mischief. Other organs normal.

Two methods of making cultivations were employed in this

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case. First of all, before the post-mortem was made, within twelve hours of patient's death, a dull area over the right base behind was chosen and carefully washed with a saturated solution of perchloride of mercury; next an incision was made through the chest-wall with a sterilised scalpel, and through this incision a capillary pipette was pushed into the substance of the lung; some of the blood and lung-juice was sucked up into the pipette and three gelatine and three agar-agar tubes were inoculated. On the next day numerous small, clear, triangular, somewhat pyramidal colonies were seen on the gelatine.

In another two days these colonies had burst and spread out into fan-shaped, translucent, whitish expansions with clearer gelatinous-looking edges. The rupture, in most cases, occurred at one point only; sometimes, however, it occurred at two opposite points, causing a double fan-shaped appearance.

Microscopically they are composed of short motile bacilli.

On agar the growth consisted of raised whitish colonies, rounded save where joined by adjacent colonies; whiter in the centre than at the circumference, and with a tendency to become woolly. In the second method of making cultivations, a portion of the consolidated right lung about an inch and a half in diameter was taken at the time of the post-mortem, about thirty-six hours after death.

This was put in a saturated solution of perchloride of mercury for a few minutes, then the excess of perchloride was soaked up with blotting-paper and the tissue divided by a sterilised knife; from the lung-juice in the centre three gelatine and three agar cultivations were made, and also some cover-glass preparations. It was thought that the risk of contamination would be greater under this second mode of cultivation, both because of the length of time which elapsed after death, and consequent liability to the multiplication of putrefactive organisms in the tissue, and also because of the liability to contamination during post-mortem examination.

It was found, however, in both cases, that the cultivations on agar and gelatine were quite pure, not containing a single adventitious organism in any one of the tubes.

I concluded, therefore, that the second method was quite satisfactory, and seeing that it is much more readily applicable than the first, it is the one I employed in my subsequent investigations. The only variation from this method consisted in diluting the lung-juice by means of boiled salt solution and making plate cultivations; in some of the cases this was employed, and will be mentioned. The cover-glass preparations of the lung-juice were stained in methylin blue, and show—

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1. Short oval rods arranged as dumb-bells, and looking like diplococci.

2. Many more distinctly short bacilli with rounded ends.

3. A few long rods.

Now, as regards cultivations, the original ones have been described, and were similar in the two modes of preparation.

*Streak* cultures on gelatine form whitish, translucent, opalescent growths, thickest along the line of inoculation; growth is not rapid, and attains its maximum in about ten days, the edges then being irregular and serrated.

*Stab* cultures consist of a thin line composed of small round aggregated colonies. On the surface a thin flat expansion, which in nine days spread to the edge of the gelatine.

*Plate cultivation* on gelatine, the colonies on the surface are flat, rounded, with irregular edges. In the depth they form small round colonies, size of a small pin-head; under the glass appear a little brownish-white in colour.

On *agar* an extensive raised white growth is formed, having a brownish tinge when much heaped up.

In *broth* (alkaline beef), at temperature 38° C., turbidity appeared next day, and in a week a definite whitish flocculent deposit, while the broth above remained turbid.

Microscopical examination of the cultures showed in every case motile bacilli. The majority gave the appearance of diplococci, but in stained specimens it was distinctly evident that they were short bacilli.

Impressions from the gelatine plate showed the same kind of bacilli; some also were seen in colonies, and a few have grown into long threads.

*Experiments on animals.*—Two guinea-pigs inoculated with the broth culture remained quite well. Two mice were inoculated with the same broth culture. Next day they seemed quite well, but on the day after, one was quiet and off its feed, and the other dead.

Examination of the dead mouse showed that the spleen was a little enlarged. There was no evidence of any lung affection.

The heart-blood and spleen-juice contained crowds of apparently the same bacillus, as inoculated cultures and sub-cultures on gelatine and agar from the heart-blood grew in a similar, but not quite identical way as the original cultivation from the lung. They differed in growing much more rapidly on gelatine, and probably, on that account, not forming fan-shaped expansions, but forming a more circular growth with irregular edges, as if they had undergone a general rather than a local rupture.

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The second mouse did not die until the seventh day and nothing definite was noticed on examination.

Many long rod-shaped bacilli were found in the spleen-juice and a few in the heart-blood.

Cultures and sub-cultures from the heart-blood yielded a few colonies of the original bacillus.

From the above experiments I deduce the following conclusions as regards this case:—

1. A peculiar bacillus was present in the original pneumonic lung.
2. This bacillus is short, oval, and might be mistaken for a coccus, seeing that it so often assumes the form of a diplococcus from two being placed end to end.
3. It is aërobic.
4. It has a characteristic growth on various media, especially on gelatine.
5. It is motile.
6. It does not liquefy gelatine.
7. It is fatal to mice when injected subcutaneously.
8. In its mode of growth and in its morphological characteristics it is identical with the bacillus isolated and described by Dr. Klein as the cause of the great epidemic of pneumonia which occurred at Middlesbrough a few years ago, and which he named the bacillus pneumoniæ.
9. The experiments on animals were insufficient to warrant any further conclusions. As far as they went, they seem to show that, like Klein's bacillus, it is more fatal to mice.

CASE II.—F. P., aged 40, farrier, admitted on June 23, 1891.

Illness began on June 21st with sudden pain in back and sides, especially left side. Vomited three times.

Next day he vomited once. Headache, cough, muco-purulent expectoration. Dyspnœa. No previous illness. Denies excess in alcohol.

*Present condition.*—A little cardiac hypertrophy and increased arterial tension. Physical signs of consolidation behind, from angle of scapula on left side, and the spine of the scapula on the right side, down to the base; also in right axilla. Pain worst on right side.

*Progress.*—Gradually got worse. Became delirious, and had delusions on night of the 24th, and died suddenly at 8.30 A.M. on the 25th. Temperature 100.4°–103.8°; pulse 108–168; respiration 54–70. Apparently a case of double pneumonia.

*Post-mortem* twenty-nine hours later showed red hepatisation of both lower lobes, except a small portion at each base which

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was collapsed. The pneumonia was most advanced at right base. Also old hydatid of liver.

*Cultivations, &c., from left lower lobe.*—Cover-glass preparations show:—

(*a.*) Many rod-shaped bacilli.

(*b.*) Some short stumpy bacilli.

(*c.*) Some cocci and diplococci; probably some are streptococci.

As a result of the cultivations on gelatine, there were found on the following day numerous minute colonies.

Twenty-four hours later these colonies became somewhat pyramidal, and a liquefying organism was also present. Streak cultivations on gelatine from the small non-liquefying colonies formed a very delicate streak in forty-eight hours. Sub-cultures on agar formed a thicker whitish growth, while broth became very turbid and contained chains of three to six cocci—evidently a streptococcus. The liquefying organism on cultivation proved to be staphylococcus aureus.

*Cultivations, &c., from right lung.*—Cover-glass preparations show:—

(*a.*) Some short stumpy bacilli.

(*b.*) A good many cocci.

Agar cultivations produced at first two kinds of colonies. Eventually these assumed the same characteristics, and proved to be staphylococcus aureus. We might conclude, therefore, that in this case two kinds of organism were present, namely, a streptococcus and staphylococcus aureus.

The latter was present in both lungs, but notably excessive in the right lung, which was indeed in a much more advanced stage of pneumonia, passing into grey hepatisation. Possibly the streptococcus was the original factor in the production of the disease, and was overwhelmed by the staphylococcus in the course of the disease.

CASE III.—T. R. S., aged 44, in the Hospital from June 22 to June 25, 1891.

At the post-mortem next day the lower lobe of the left lung was found to be in a state of red hepatisation. Some obsolete phthisis was found at left apex, and at the right base a few small deposits suggestive of tubercle. Also gout and granular kidneys.

Cover-glass preparations show:—

(*a.*) Apparently diplococci.

(*b.*) Some short stumpy bacilli.

Cultivations resulted in the production of no growth on two out of three agar tubes, but on the third a number of gelatinous-

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looking whitish colonies. Sub-cultures from these on gelatine and broth show them to consist of streptococci. From the gelatine cultures a similar organism was obtained, and also staphylococcus albus.

*Result.*—Streptococcus pyogenes and staphylococcus albus.

CASE IV.—E. C., aged 62, in Hospital from June 29 to July 9, 1891.

Grey hepatisation of lung found post-mortem. Cover-glass preparations show cocci and a few very short rods. On one of the agar cultivations kept at a low temperature about twenty small whitish colonies appeared in three days, apparently identical. In a week they formed small, dull, white, sharp-edged, round colonies, reaching in size that of a small pin-head. In the hot incubator they have the same character, but grow quicker and larger.

Gelatine streaks grew slowly, and consisted of small, dull, white, round colonies. On agar the growth was rather more profuse and whiter. The organism was a streptococcus. From the original gelatine plate several different organisms were grown, namely :—

1. Mould.
2. Staphylococcus aureus.
3. Staphylococcus albus.
4. Staphylococcus, forming a thick, waxy, white growth on gelatine without liquefaction.
5. Streptococcus like the one described above.

CASE V.—W. A., aged 35, admitted February 24, 1892, and died the same day. Had been taken suddenly ill during the night. Post-mortem there was found commencing pleuro-pneumonia on right side and a patch of red hepatisation; also adherent pleura and advanced disease of the suprarenals :—

Five cover-glass preparations show very few organisms of any kind.

(*a.*) No bacilli.

(*b.*) A few cocci arranged as diplococci; no capsules.

(*c.*) A few short chains of four cocci.

Gelatine cultures showed in five days numerous small raised white colonies. In another week they were larger and whiter, and had become star-shaped. No other kind of organism was present. Streak sub-cultures grew slowly, and in a week's time were seen to consist of aggregations of raised white dots, with rows of dots running laterally; growth comparatively slight. Later on the streaks became curiously tesselated.

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Stabs grow slightly in the depth, and similarly consist of minute round colonies.

Microscopically they are seen to consist of cocci which, when isolated, look like diplococci. There is no liquefaction. On agar a considerable raised white growth was produced in two days, and showed microscopically the same appearances.

Two days' growth in broth produced a stringy deposit, and the supernatant fluid became turbid.

Mice inoculated with this broth culture remained perfectly well. The original agar cultivations only yielded the same organisms.

Two broth cultures were also made primarily from the lung-juice.[1] One became cloudy, and yielded a mixture of organisms, prominent among which was a long rod-shaped bacillus growing in groups; the other also gave a mixture of cocci and short stumpy rods.

*Sections.*—Great engorgement with blood. Almost all the alveoli filled with recent exudation entirely devoid of micro-organisms. A few of the alveoli contain many organisms, chiefly cocci, in the exudation.

*Result.*—A variety of staphylococcus, which does not liquefy gelatine and does not affect mice.

Case VI.—W. M., aged 25, draper's assistant, was admitted to Matthew Ward on March 24, and died on March 29.

*Clinical abstract.*—Sudden onset day before admission. Seemed very feeble and exhausted. No albuminuria. Well-marked arcus senilis. Impaired resonance over whole of left back, and later signs of consolidation of lower lobe; good resonance and some rhonchus noted over right lung on the day before death; also on this day a cloud of albumen. Gradually got worse.

Temperature never above 102.6°; very irregular; lower on the two last days of his life; not at all characteristic of croupous pneumonia.

*Post-mortem* twelve hours after death.—Red hepatisation of left lower lobe, with much lymph and turbid fluid in the pleura; less advanced red hepatisation of right upper lobe.

Cover-glass preparations of lung-juice taken from the left lower and the right upper lobes show only one kind of organism, which is fairly numerous in the case of right lung, but scanty in the left. This organism is a short, thickish bacillus, with angles usually, but not always, rounded off. These bacilli are usually in pairs, placed end to end, and frequently exhibit marked bipolar staining.

[1] The rod-shaped bacillus in the broth-culture made direct from the lung-juice was not found in any of the other cultures, nor in any of the five cover-glass preparations of the lung-juice.

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Cultivations on agar-agar from the left lung kept in the hot incubator, produced in twenty-four hours large rounded well-defined whitish gelatinous flat-topped colonies, about ¼ inch in diameter.

In another twenty-four hours the colonies were thicker and whiter, still gelatinous-looking, edges raised and well defined, growth thick in the centre. A few small clear colonies also present.

Cover-glass preparations show them to consist of short stumpy bacilli with rounded ends, many apparently dividing, some thick and long and in threads.

The gelatine cultivations only produced a few small angular colonies, and one which was larger, fluffy, and iridescent.

*Cultivations from right lung.*—Growth of similar colonies on agar-agar to what resulted in the case of the left lung; much more numerous, however, on gelatine. In twenty-four hours numerous small angular colonies. In forty-eight hours most of these burst, as it were, some only at one side, forming a fluffy fan-shaped expansion, some at opposite poles, forming a double fan-shaped expansion, while a few appeared to undergo general rupture, and to be fluffy all round. The expansions are iridescent.

Now, comparing these different cultures, we find one organism markedly predominant. We notice, too, that it is much more numerous in the right than in the left lung. Assuming, then, that this organism has a causal connection with the disease, we must assume also that, because pneumonia is more recent on the right side, therefore the bacillus is there more active. Possibly, as the pathological process progresses in the part, the organism dies, either from lack of nutrition, having utilised all there available, or poisoned by its own peculiar products.

As regards streak cultures on gelatine made from the original tubes, those from the right lung formed in all cases, in twenty-four hours, a raised whitish growth in the centre with lateral fluffy edges, and beyond these, clear gelatinous expansions, very iridescent. Four days later they were noted to have continued growing freely, almost covering the surface of the gelatine, bluish and opalescent, with a very glistening border.

Of these cultures made from the left lung primarily, one was pure, and resembled the above in every respect. Two others gave the same result, but contaminated with another organism. The fourth contained a different organism.

*Broth cultivations* were in forty-eight hours cloudy throughout; a fair amount of a somewhat stringy deposit at the bottom of the tubes. Microscopically, at the end of four days, they

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consisted of bacilli which varied a little in size and depth of colour, some vacuolated, some short threads. Streak cultivations on *agar* produced in two days at 38° C. a thick raised whitish gelatinous growth, with crenate well-defined borders, consisting of short bacilli with rounded ends, all about the same size, and not as big as in the lung-juice or in broth cultures; no vacuolation and no threads.

*Microscopical examination of sections.*—Right lung: red hepatisation. In some no organisms found; in others the majority of the alveoli are free from organisms, but here and there are alveoli in which the contained products are crowded with bacilli similar to those described. None found in the blood-vessels. Left lung: hepatisation more advanced, in some alveoli passing into grey. No large collections of the bacilli found; a few isolated ones, or groups of three or four. None in the vessels.

*Experiments on mice.*—Two mice inoculated with eight minims of a two days' old broth culture remained well. One mouse inoculated with twelve minims of a four days' old broth culture remained well. One mouse inoculated with fifteen minims of the same culture was found dying next day. It was killed, but nothing definite was found post-mortem, except a little excess of peritoneal fluid. No enlargement of the spleen.

Cover-glass preparations of the heart-blood were found to be crowded with bacilli, some oval, and having marked bipolar staining (*cf.* Klein). Cover-glass preparations from the lungs show many of the same bacilli.

Gelatine cultures from the heart-blood produced a pure free growth of the organism in two days. Nothing was obtained by cultivation from the lung.

Two mice inoculated with 15 to 20 minims of a broth and albumen culture. One was ill next day, but recovered. The other was very ill, frequent respiration, hair on end, off its feed. It was more lively on the next day, but died the day after.

In the heart-blood and spleen-juice only a few doubtful organisms were found; none were recovered by cultivation. Some enlargement of the spleen was noted.

Thus, out of six mice inoculated, three apparently were unaffected, one was ill and recovered, one died, but the organism with which it was inoculated was not obtained from the blood or spleen; one died, and the blood was found crowded with the organism. In no case was there any evidence of pneumonia.

*Conclusions.*—One particular organism was present in this case. It was present in the alveolar secretions, not in the blood.

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There is no evidence that it was the cause of the pneumonia. In many respects it is like Klein's pneumonia bacillus, perhaps an allied species—probably the same organism.

CASE VII.—C. D., aged 26, was admitted on the sixth day of her illness, and died on the thirteenth day, May 16, 1892.

*Clinical abstract.*—Onset sudden. Had been in bed since. Temperature 105°; pulse, 156, respiration, 60 on admission. Signs of pleuro-pneumonia of right lower lobe. First sound of heart barely audible. Altogether her condition desperate.

Next day it was evident that the whole of the right lung was involved. To the end her temperature kept up between 102° and 104°, except on the ninth day, when it fell to 100.2° in the morning.

Pulse ranged between 120 and 160; respiration 60 to 88. Diarrhœa severe and continuous throughout.

*Post-mortem.*—Grey hepatisation of right lung. Left lung somewhat congested and œdematous. Cloudy swelling of liver, spleen, and kidneys.

*Cover-glass preparations* of lung-juice only show a scanty supply of small cocci arranged as diplococci; some in short chains. No capsules.

*Cultivations on gelatine.*—In twenty-four hours a few small angular colonies. In six days these were round and white, very small, the biggest not being larger than a very small pin-head. In another week they had increased in size, and consisted of a yellowish central portion, with small radiating white processes. These cultivations remained pure at the end of five months.

Streak cultivations on gelatine grew slowly, and consisted of small rounded colonies. Microscopically, small cocci arranged as diplococci and short chains.

*Cultivations on agar.*—In twenty-four hours a few small clear colonies appeared; later on, a clear delicate filmy growth formed over the lower part of the tube, and a little deposit in the water of condensation. It consisted of small cocci, arranged as diplococci, and some of these in short chains. Many involution forms. Sub-cultures produced in two days clear gelatinous colonies; when isolated not easily seen. Others formed a delicate gelatinous-looking film of minute rounded colonies. Microscopically composed of diplococci, forming occasionally short chains.

*Sections of lung.*—Five show grey hepatisation. Only a few small cocci and diplococci found.

CASE VIII.—J. S., aged 26, labourer (soldier until February), was admitted on May 10, and died on May 15 (seventh day).

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*Clinical abstract.*—Sudden onset on the morning before admission, and hæmoptysis during the day. Had had ague and syphilis. No phthisical history. Signs of pneumonia of left lower lobe. No albuminuria during his illness.

On the 13th the pneumonia had involved the whole left lung.

On the 14th frequent vomiting. Apparently died of exhaustion.

Temperature 103–104° at nights, and 101–102° in mornings, except on the fourth day, when it fell to 99.6°, and during the last thirty-six hours, when it seemed to come down by lysis.

*Post-mortem.*—Pleuro-pneumonia. Inflammatory lymph and some fluid in the left pleura. Red hepatisation of upper lobe, and great congestion of the lower lobe, which sank in water. Some congestion of right lung. Intense pericarditis. Partial peritonitis. Syphilitic pharyngitis.

*Cover-glass preparations of lung-juice.*—A good many diplococci without capsules, some forming short chains and some looking like bipolar bacilli. A few stumpy bacilli; some of these in groups of four or five. A good many long rods.

Cultivations made thirty hours after death:—

(*a.*) *From the pericardial lymph*, well washed in boiled salt solution, a variety of micro-organisms were obtained, sarcina lutea and three kinds of staphylococci. But there is one organism which forms clear, flat, gelatinous-looking colonies, small, round, and almost invisible on account of their similarity in colour to the agar on which they were grown. Sub-cultures from these on gelatine showed no growth at the end of four days. Sub-cultures on agar at 38° C. formed a clear, flat, gelatinous growth, which on microscopic examination was found to consist of a fair-sized bacillus, forming threads. In other sub-cultures they were found to vary considerably in length, thickness, and depth of staining. Sub-cultures from this last in broth formed in two days small white fluffy ball-like masses, the broth itself remaining clear. Even after a month's growth these masses had not increased much in size, and the broth remained persistently clear. They consisted of aggregations of rod-shaped bacilli.

(*b.*) *Cultivations from the pneumonic lung.*—Two main kinds of organism were obtained from the original cultivations on agar:—

1. Small white colonies formed in twenty-four hours. Sub-cultures of these on gelatine and agar produced a moderate growth in twenty-four hours, which consisted of small cocci in groups, and short chains.

2. Small, clear, flat, round gelatinous colonies, distinctly visible in seventy-two hours. They may have been present before and been overlooked, as they are so remarkably clear and like the agar on which they grow.

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*Sub-cultures on agar.*—In twenty-four hours a scanty growth of minute colonies consisting of rod-shaped bacilli forming chains, loops, and rosettes. Some appear to be curved. They vary in length. One of the agar original cultivations yielded a large number of colonies of staphylococcus aureus. Hence from the lung three kinds of organism were obtained by cultivation on agar at 38° C.

*Cultivations from the pneumonic lung on gelatine.*

1. Sarcina lutea—many colonies in one tube.
2. A single liquefying organism in the three tubes.
3. A large number of minute clear colonies, which on cultivation proved to be small cocci, diplococci when isolated.
4. A few large white colonies of staphylococci. The sub-cultures from group 3 were found also to contain a few long rod-shaped bacilli.

Thus, taking the whole of the cultivations on agar and gelatine, we find several cocci, probably unimportant organisms. We find also an organism with a characteristic growth on agar at the temperature of the body. This organism is a bacillus, long and forming chains, growing very feebly on gelatine, and not at all vigorously on agar. Its growth on agar and its microscopic appearances are the same as those of the bacillus obtained from the pericardial lymph. Cultivations on broth also grew in identically the same way, but the white balls were rather more numerous, larger, and more fluffy than the corresponding cultivations of the pericardial organism. The broth remained clear. Microscopically they were the same.

*To sum up the character of this organism. Microscopically*, it is a bacillus, long, forming threads, wreaths, and rosettes under favourable circumstances.

*On agar at* 38° C.—Isolated colonies are clear, flat, round, same colour as the agar; do not grow to above one-fifth inch in diameter.

*In broth at* 38° C.—Isolated masses like small fluffy white wool walls; broth remains clear. On shaking, the masses break up, and then settle down as a scanty fine sediment.

*On potato at* 38° C.—In three weeks a slight tough, glistening film, resembling boiled sago in colour.

*On gelatine.*—Streak sub-cultures, from agar sub-cultures, formed in three days a scanty growth of small fluffy colonies. Quite pure.

*Experiments on mice.*

(*a.*) Two mice inoculated with 10 minims of a ten days' old broth culture died in two days. One was half eaten by the other. In the other the spleen was found much enlarged and the lungs distinctly congested. Cultivations only yielded a streptococcus and staphylococcus albus.

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In the spleen an occasional coccus was found. In the blood, no micro-organisms. In the lung-juice, only a few cocci.

(*b.*) Two mice inoculated with 20 minims of a three days' old broth culture seemed a little ill in two days, and in another two days were almost dead, so were killed.

In one the spleen was a little enlarged. The left upper lobe was intensely congested and almost airless; the rest of the lung congested. In the other the spleen was of normal size. Both lungs were congested, but more especially the right lower lobe. The organism was not found in cover-glass preparations of the heart-blood in either case, nor could the organism injected be recovered from the blood.

(*c.*) Four mice inoculated with a culture fifteen days old.

(*d.*) Two mice inoculated with a culture two days old; scanty growth.

(*e.*) Two mice inoculated with a culture three days old; scanty growth.

All remained well.

Thus of twelve mice four died, and in three there was distinct evidence of pulmonary disturbance. The fourth could not be examined.

*Sections of lung.*—Six examined, stained in carbol blue. Only a few cocci and diplococci found. The tissue was in a state of red hepatisation.

CASE IX.—J. D., aged 28, was admitted on the first day of his illness and died on the tenth day.

*Clinical abstract.*—Sudden onset; pain in left side. Had ague five years ago. No physical signs of pneumonia. Liver enlarged. Urine contains a trace of albumen. Developed signs of consolidation on fifth day, and also delirium tremens. On the seventh day considerable rhonchus over left lung. Sweated profusely.

On the eighth day there were signs of consolidation to apex. Next day abundant crepitations noticed over left side.

Died suddenly during the night.

Temperature 102°–104°, until the last twenty-four hours, when it was only a little over 100°. Pulse 100–140; respiration 24–44.

Apparently a case of lobar pneumonia complicated by enlarged liver, delirium, which was probably alcoholic, and without a crisis.

*Post-mortem* thirty hours after death.—Consolidation of whole of left upper lobe, red hepatisation, and just commencing in the upper part of the lower. The upper part of the upper lobe was becoming grey; the lower part, being more recent, was taken for cultivation. General pleurisy and effusion of lymph.

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*Cover-glass preparations* of lung-juice, gentian violet, or carbol blue show cocci arranged as diplococci or as short chains; also one large group found.

Cultivation resulted in the production of numerous colonies of an organism, staphylococcus, which forms on agar a deep orange-coloured growth, profuse, crinkled on the surface.

In stab gelatine cultures, liquefaction occurs with moderate rapidity, forming in a week a tubular liquefaction with scanty yellowish deposit.

The organism differs from staphylococcus aureus in its greater depth of colour and its less rapid liquefaction of gelatine. It might be called staphylococcus aurantius.

Only one other organism found in any of the original cultures, namely, a colony of staphylococcus aureus.

*Sections* show red hepatisation. Only an occasional coccus found in any one of five specimens examined.

Case X.—W. M'C., aged 34, lighterman, was admitted on the fifth, and died on the eighth day of his illness.

*Clinical abstract.*—A heavy drinker. Onset not very sudden or severe. Has had syphilis six years ago. General rhonchus; fingers a little blue; considerable tremor. On the seventh day definite signs of consolidation of right upper lobe. Rapidly got worse, feebler, and more blue.

Temperature did not come down, though it dropped a little on the seventh day; highest point 105.4°; pulse 108–120; respiration 23–30.

*Post-mortem* twenty-seven hours later showed consolidation of right upper lobe, almost grey. Many minute specks of pus in the bronchioles. A portion from the apex, apparently free from pus, taken for examination.

*Cover-glass preparations* show a good large number of cocci arranged as diplococci, some forming chains of four to sixteen; also a few long rods scattered about.

*On gelatine* at end of a week there were a very large number of small, clear, raised, rounded colonies; also colonies of staphylococcus aureus, and one of sarcina lutea. Similar minute colonies were formed on agar; they proved on cultivation to be a streptococcus. Also on one of the original gelatine tubes a large coral-like pink colony grew, which was found to be a bacillus, occasionally comma-shaped.

*Sections* show red hepatisation and a very few scattered cocci. An occasional alveolus is found, however, which is crowded with streptococci, small, and arranged in threads of varying length.

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CASE XI.—J. K., aged 27, porter, was admitted on seventh day of his illness, and died the following day.

*Clinical abstract.*—A heavy drinker. Temperature 101.6°. Much tremor; signs of consolidation at right base behind; also fine crepitations and impaired note over right apex in front.

Became violently maniacal at night; had to be fed with a tube; got much worse during the night, and more blue.

Temperature in morning rose to 106°, and lividity increased. Breathing very shallow. Pulse uncountable. Temperature 107.4° in axilla after death.

*Post-mortem* twenty-five hours later.—Consolidation of right upper lobe, becoming grey; red hepatisation of upper part of right lower lobe; a portion of this taken for examination.

*Three cover-glass preparations* of the lung-juice show a considerable number of long rods, especially in one specimen. A large number of cocci, diplococci, and short chains in all; possibly some are short bacilli; very like, microscopically, what were found in the last case.

*Cultivations on gelatine* showed in twenty-four hours a large number of small round colonies, almost all of which have burst and formed fan-shaped or bi-fan-shaped expansions with clear gelatinous edges. Microscopically, short bacilli; some look like diplococci; also some long threads.

Sub-cultures, streaks on gelatine, formed a semi-translucent central growth and clear lateral expansions. In twenty-four hours considerable liquefaction.

Liquefaction proceeded rapidly in all the tubes, and a dense white deposit sank to the bottom.

*Cultivation on agar* produced in twenty-four hours a dense white growth, covering the whole surface of the medium, and forming a fair amount of deposit in water of condensation. Microscopically, a very short bacillus.

*Sub-cultures on gelatine* showed it to be the same organism as was found on the gelatine cultures.

*Sub-cultures on broth* became turbid throughout, and formed a considerable deposit. Hence the only result is this organism, proteus vulgaris; the others seen in cover-glass preparations must have been swamped by the profuse and rapid growth.

*Sections* show a considerable number of rods and cocci.

In conclusion, I wish to acknowledge my indebtedness to Dr. Klein for his valuable criticisms and advice, and also for his kindness in performing the inoculation experiments.

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# SUPPRESSION OF URINE IN DIPHTHERIA.

BY

G. G. MORRICE, M.D.

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By the admission of cases of diphtheria into the hospitals of the Metropolitan Asylums Board, a valuable opportunity of studying that disease has been offered to students. I desire to take advantage of the material at my disposal during three years' residence at the Eastern Hospitals in order to supplement Dr. Gee's paper on "Repeated Vomiting a Bad Prognostic in Diphtheria."[1]

To those who wish to have the whole subject of diphtheria in its clinical aspects expounded in a lucid and exhaustive manner, I would commend the chapters devoted to it in M. Cadet de Gassicourt's "Maladies de l'Enfance." Even there, we are sometimes disappointed by the incompleteness of the data. The truth is, that to unravel the intricate problems connected with this fatal and fascinating disease, we must be with the patients continually; ready to make our observations at whatever hour of the day or night changes in their condition may occur.

In this paper I shall try to further illustrate one particular type of case, viz., that in which suppression of urine, complete or nearly complete, is the leading feature. It will be seen how closely the cases resemble most of those recorded by Dr. Gee. There are many ways in which diphtheria may prove fatal: hyper-intoxication, obstruction in the air-passages, starvation, paralysis of the diaphragm, cardio-pulmonary paralysis (syncope), and lastly, suppression of urine.

We find ourselves continually asking: is the vomiting and concomitant slowness of the pulse of nervous origin, an affection of the par vagum and comparable to the vomiting (accompanied by pallor and faintness) of a boy smoking his first pipe? or is it of uræmic origin? The reader will probably

[1] St. Bartholomew's Hospital Reports, vol. xxv.



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not be satisfied with the suggestion that the same combination of symptoms may have two distinct origins in two distinct types of case; yet it is almost forced upon us by a study of the recorded cases.

Of the first type we have a complete picture by Dr. C. de Gassicourt. Paralysis is the pivot on which his phenomena move; by a sort of accident the paralysis leaps from a region where it is harmless to a region where it is fatal (cardio-pulmonary paralysis). Many of his cases are comparable with Dr. Leonard Guthrie's "Bulbar Crises." "Dans les trois cas que je vous ai cités, la marche de la maladie a été presque foudroyante. La paralysie du voile du palais a ouvert la scène; elle y est restée limitée pendant dix-huit à vingt heures dans un cas. . . . Puis tout à coup, les fonctions du cœur et du poumon ont été enrayées: la dyspnée, le ralentissement suivi d'acceleration des battements du cœur, la cyanose en sont la preuve. Enfin, les malades sont morts subitement de syncope, une heure après le début des accidents."

In place of this "marche foudroyante," I observe an almost perfectly regular development of phenomena. The pulse, counted at the same hour every evening (to eliminate disturbing elements), is found to fall in frequency from the beginning of the disease, when it is about 120, to a certain crisis at which one of two things may happen: (1) a rapid acceleration with extreme irregularity, followed by death; (2) a stationary period, which may persist for some days, and be followed by a gradual return to the normal. Side by side with this there is going on a steady diminution of the urine. This, however, bears no apparent relation to the albuminuria, which may pass by a leap from a large amount (three-quarters or a half) to a mere trace. Vomiting begins usually about twenty-four hours before death. During the day preceding death only a few drachms of urine are passed. There is no *coma;* on the contrary, the mind is perfectly clear. There is no relation to *paralysis*, at least so far as the palate is concerned. The patients should never be taken out of bed to test their limbs. *Convulsions* sometimes, but very rarely, precede death. *Ascites* also is very rare; about 10 oz. was found in one case. The bladder is found quite empty and firmly contracted. The kidneys are in a state of acute nephritis.

This, then, is the second type of case in which vomiting and slowing of the pulse occur.

I can find no mention of the quantity of urine passed in the cases recorded by De Gassicourt, but suppression would certainly not have escaped notice.

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CASE I.—Morris S., aged 4. Admitted April 1, 1892, after two days' illness.

April 2.—A large piece of discoloured membrane on the left arch and adjacent soft palate. Nares sore. Passed 5 oz. of urine in thirty-five hours. Pulse 84.

April 3.—Pulse 88 at both morning and evening visit.

April 4.—Vomited. Passed 7½ oz. of urine in twenty-four hours. Pulse 92 in the morning; 60 in the evening.

April 5.—I saw the boy at 5.15 A.M. He was very pale; had vomited several times in the night. Only 1 oz. of urine had been passed since eight o'clock on the previous evening. His pulse had dropped to 44, so I probably made my note at about the turning-point. During the day it rapidly but steadily increased in frequency. At 11 A.M. pulse 80, regular; at 12.30 pulse 100; at 3 P.M. pulse 116; at 4.40 P.M. death, preceded by a short convulsion. Only a few drops of urine were passed during the day.

CASE II.—Nellie J. Admitted November 20, 1890.

Pulse-rate of Nellie J.:—

| | | | |
|---|---|---|---|
| Nov. 18 | . . . 108 | Nov. 24 | . . . 92 |
| „ 19 | . . . 102 | „ 25 | . . . 84 |
| „ 20 | . . . 104 | „ 26 | . . . 74 |
| „ 21 | . . . 103 | „ 27 | . . . 60 |
| „ 22 | . . . 108 | „ 28 | . . . 84 |
| „ 23 | . . . 96 | „ 29 | . . . 88 |

On admission, membrane on both tonsils; considerable œdema of adjacent soft palate.

November 18.—Gelatinous membrane spreading from the tonsil on to the soft palate on the right side. No albumen.

November 22.—Albumen two-fifths.

November 27.—Voice very nasal. Fluids return through nose.

November 28.—Vomited once.

November 29.—Died "suddenly."

CASE III.—Sarah P., aged 5. Admitted November 26, 1891.

Membrane on both tonsils. No albumen.

November 29.—Diffuse swelling below the right ear.

December 1.—Discharge from the nose. Glandular swelling below both ears. Albumen a cloud.

December 2.—Continual retching. Some dark-coloured blood at the back of the throat (epistaxis).

December 4.—The lips have a greyish tinge. Heart-sounds quite clear and regular. Urine much diminished; about 2 drachms passed during the day.

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December 5.—Died at 6.40 A.M.

Evening pulse-rate:—

| | | | |
|---|---|---|---|
| Nov. 30 | 132 | Dec. 3 | 68 |
| Dec. 1 | 132 | „ 4 | 60 |

*Post-mortem.*—The peritoneal cavity contained about half a pint of straw-coloured fluid. The kidneys were in a state of acute nephritis.

CASE IV.—Charles L., aged 6. Complained of sore throat on September 27, 1891. Admitted on September 29. Fauces covered with thick yellow membrane. Watery discharge from the nose. Knee-jerks active. A cloud of albumen.

October 1.—A piece of membrane (a quarter of an inch thick) is exfoliating from the soft palate. Nostrils full of semi-transparent fluid. Redness and swelling on the left side of the neck.

October 4.—Has vomited often; coffee grounds.

October 5.—Has not passed urine during the night. None passed during the day. The last specimen contained very little albumen.

Evening pulse-rate:—

| | | | |
|---|---|---|---|
| Sept. 29 | 116 | Oct. 3 | 108 |
| „ 30 | 108 | „ 4 | 72 |
| Oct. 1 | 108 | „ 5 | 128 |
| „ 2 | 116 | | |

He died suddenly two hours after the last record of the pulse-rate.

*Post-mortem.*—Hæmorrhages on the pleural surfaces; hardly any clot in the heart; bladder firmly contracted, quite empty. Under the microscope the kidneys are seen to be in a state of acute nephritis, and the pulmonary vesicles in many parts full of blood-cells.

CASE V.—Caroline E., aged 8. Admitted October 7, the third day of her illness.

Pulse-rate of Caroline E.:—

| | | | |
|---|---|---|---|
| Oct. 8 | 135 | Oct. 15 | 60 |
| „ 9 | ... | „ 16 | 52 |
| „ 10 | ... | „ 17 | 52 |
| „ 11 | ... | „ 18 | 52 |
| „ 12 | 124 | „ 19 | 62, E. 75 |
| „ 13 | ... | „ 20 | 92 |
| „ 14 | 58 | „ 21 | 108 |

On admission, there was considerable diffuse swelling on both sides of the neck. Uvula and arches covered with membrane.

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October 14.—Urine nearly solid with albumen. Vomited four times during the day.

October 18.—Albumen a thick cloud; knee-jerks exaggerated.

October 20.—Pulse extremely irregular; sometimes at the rate of 80 for a quarter of a minute, and then at more than double that rate for a few seconds.

October 21.—Pulse scarcely perceptible at wrist; hands and feet cold. Died.

Cases II. and V., in which there is no record of the amount of urine passed, show how important it is to watch for the *end of retardation.* Patients are frequently said to die "suddenly," *i.e.*, no change in their condition is apparent to any one who has not carefully watched the pulse-rate.

I give, finally, for the sake of comparison, an example of recovery, showing the gradual return of the pulse-rate to the normal, and its relation to the amount of urine excreted.

CASE VI.—Mabel S., aged 11. Admitted March 1, 1892.

Pulse-rate of Mabel S.:—

| | | | |
|---|---|---|---|
| March 1 | 114 | March 11 | 62 |
| „ 2 | 104 | „ 12 | 62 |
| „ 3 | 92 | „ 13 | 56 |
| „ 4 | 80 | „ 14 | 56 |
| „ 5 | 88 | „ 15 | 68 |
| „ 6 | 88 | „ 16 | 92 |
| „ 7 | 72 | „ 17 | 68 |
| „ 8 | 78 | „ 18 | 80 |
| „ 9 | 72 | „ 19 | 80 |
| „ 10 | 60 | „ 20 | 92 |

Illness began on February 28 with sore throat. On admission, white membrane on tonsils and anterior pillars.

March 4.—Uvula encased in membrane. No albumen.

March 8.—Thick cloud of albumen.

March 11.—Much albumen.

March 14.—Vomited. Only 12 oz. of urine passed in twenty-four hours.

March 18.—Albumen a thick trace.

March 19.—Passed 28 oz. of urine in twenty-four hours.

The patient made a good recovery.

With regard to treatment, no topical applications of any kind were employed. The patients, as soon as they were admitted, were given one- two- or three-fortieths of a grain of bicyanide of mercury every two, three, or four hours. For instance, a

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baby of one year will take one-fortieth grain every two hours; a child four years of age will take one-twentieth grain every three hours. Larger doses than these are liable to produce enteritis (bloody mucus in the motions). In addition to this, large quantities of port-wine were given, three ounces to a child of four years, five to a child of ten. When vomiting set in, the milk was peptonised, and the wine given by the rectum. The recumbent position was strictly enforced.

I am indebted to Dr. Collie and Dr. Goodall for permission to publish these cases.

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# NOTES FROM THE ORTHOPÆDIC DEPARTMENT.

## ON THE TREATMENT OF SEVERE CASES OF CONGENITAL CLUB-FOOT.

BY

W. J. WALSHAM.

When the charge of the Orthopædic Department was handed over to me, now some ten years ago, I confess I knew very little of orthopædics beyond what I had learned from the works on general surgery and from such practical experience as had been picked up from isolated cases that had come under my care from time to time as Surgeon to the Metropolitan Hospital, and for a shorter period as Assistant-Surgeon to St. Bartholomew's. I naturally at once set to work to read up what had been said in the special works on the subject. As regards congenital club-foot, in the treatment of which I acknowledge my success had not been great, I imagined, from what I read in these works, that by implicitly following the lines there laid down with great minuteness, and that by personal supervision of every detail in the turning of screws, the adjustment of straps, &c., all cases of club-foot, however severe, would no longer prove the bugbears I had hitherto found them. But I soon discovered that although slight cases, in whatever way they were treated, provided they came sufficiently early under notice and received such care and attention as any general surgeon was capable of giving, almost uniformly got well, severe and relapsed cases did not yield to the methods that were said, or as I understood them, to be infallible. I found not only that I was unable, by mere tenotomies and mechanical extension, to cure certain of my own severe cases, but also that from time to time there came to the department cases which had not been cured at the special Orthopædic Hospitals, although they had attended there for

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many years, and had undergone the orthodox treatment of that particular institution. Against my will, therefore, I was driven to the conclusion that there are, whatever may be said to the contrary, many severe cases that cannot be cured without some operation involving the removal of bone.

The bone operations I have performed are complete or partial removal of the astragalus and the excision of larger or smaller wedges of bone from the region of the transverse tarsal joint.

The deformities of the bones that have been met with in congenital club-foot consist chiefly in an alteration in the direction of the head and neck of the astragalus and in an inward bowing in its long axis of the os calcis.

The neck of the astragalus is deflected inwards and downwards, so that the articular surface which is in contact with the scaphoid looks almost directly inwards, instead of forwards as in the normal foot. The inward deflection has been long well recognised; the downward deflection has not received, I think, the attention it deserves. It is this downward deflection, I hold, that in many cases prevents the equinus position of the foot after division of the tendo Achillis, and even the posterior ligament of the ankle-joint, being completely overcome. All who have had to deal much with severe cases of the affection must have been disappointed on dividing the tendo Achillis to find that, contrary to their expectation, the foot could not be forced up to a right angle with the leg. The reason for this, at least in the cases to which I am referring, is that the equinus does not depend, as is generally taught, on the mere partial tilting of the astragalus from its socket, but on the downward bend of the astragaloid neck. Where the astragalus is merely partially tilted out from between the malleoli, as in paralytic equinus and in slight cases of the congenital affection, tenotomy of the tendo Achillis suffices, as a rule, to allow it to be readily replaced. But in congenital club-foot, where the condition I have mentioned exists, after the severance of the Achillis tendon, and even of the posterior ligaments of the ankle, on endeavouring to press the foot upwards the bones are felt to lock; the astragalus as far as it is displaced can be replaced, but this is not sufficient to allow the foot to be brought to a right angle with the leg. The equinus, as I have said, depends upon the downward deflection of the neck, and can only be overcome in children of three or four or upwards and adults by the removal of a portion of bone. In infants, on the other hand, the bones are so soft—in fact, they consist at birth of little more than cartilage—that they can be readily moulded, and by judicious treatment made to take their normal shape. Hence the importance of beginning treatment at the very earliest

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possible period after birth. When this is done, there are few cases that cannot be so completely and satisfactorily cured that practically a normal foot is obtained. This is, of course, not the case after a tarsectomy; the foot is then at the best a mutilated one, but at the same time a useful member—far preferable, both as regards external appearances and as an organ of locomotion, to what it was before operation. After an astragalectomy, if massage and passive movements are sedulously kept up, very fair movement at the ankle-joint is obtained, and what range of movement is lost here is compensated for to a great extent by the freedom of movement which is obtained at the sub-astragaloid joint. As regards the shape of the foot, the operation leaves very little to be desired. Astragalectomy alone, however, in advanced grades of the deformity, may not be sufficient either to permit of the cure of the varus or of the equinus. Where the varus cannot be overcome, a wedge from the tarsus must be removed as well as the astragalus. This I have done by cutting away, little by little, slices from the adjacent parts of the bones sufficient to allow the foot to be placed in line with the leg, rather than by a second set operation. Where the equinus on the removal of the astragalus has not been sufficiently overcome, I have either divided the external malleolus just below its articulation with the tibia, and bent it backwards so as to allow the os calcis and cuboid being forced sufficiently upwards to rectify the foot, or have removed a portion of the os calcis or of the cuboid. In some instances I have had to take away the cuboid, the scaphoid, half the os calcis, and, in exceptionally severe cases, even more of the tarsal bones. The rule I would venture to lay down in operating on these severe cases is that sufficient bone must be taken away to completely overcome the deformity, so that when after the operation the foot is placed in plaster of Paris, it is simply held in the rectified position without any tension or strain. If an insufficient amount of bone is removed, and the foot is only held in a good position by force, my experience is that it is nearly sure, sooner or later, to relapse. In the removal of the astragalus I have always employed Lund's external incision—that is, an incision extending forwards and inwards between the peroneus brevis and tertius. No tendon or other important structure is thus cut. Plenty of room is obtained, not only for the removal of the astragalus, but for other portions of bone as well, if found necessary, and a single linear scar alone remains. It is astonishing how small and insignificant the scar becomes in time, and how difficult it would be to say after some years what operation had been performed on the foot.

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In my later operations the skin wound has been completely closed without a drain of any kind, and the Esmarch's bandage, which has been nearly always employed, has not been removed until the dressings have been applied and the foot firmly closed in plaster of Paris. Any oozing into the cavity of the wound is, I take it, an advantage rather than a disadvantage; an aseptic clot is formed, filling the gap left by the removal of the bone, and tends to ensure fibrous rather than bony union, and hence movement at what was the former ankle-joint. The plaster and dressings are not removed for some three weeks to a month, when the wound is nearly always found healed. The child may have some pain, but often there is practically none, and the case runs as simple a course as after an ordinary tenotomy.

Where the varus position is the most marked feature, the removal of a wedge of bone from the neighbourhood of the transverse tarsal joint is perhaps preferable to astragalectomy. The wedge consists of a portion of the cuboid and os calcis on the outer side of the foot, and of a smaller portion of the scaphoid and astragalus on the inner side. The base of the wedge must be sufficiently broad to allow of the easy rectification of the foot, a further wedge-shaped slice of the os calcis and cuboid being removed if necessary. Although the bones may now no longer prevent the foot being brought into a straight line with the leg, the foot may still be found to spring back into the deformed position when the retaining force of the hand is relaxed. Under these circumstances it will be advantageous to divide from within the wound any tense ligaments on the inner side of the foot. In doing this, care must, of course, be taken not to cut so deeply towards the skin as to endanger the posterior tibial vessels and nerves, the normal relations of which are, of course, to some extent at least, disturbed. After the foot has been straightened, the division of the tendo Achillis will now generally allow of its being brought up to a little beyond a right angle with the leg. If not, a further slice for the neck of the astragalus will generally suffice. But in removing this extra slice, it is as well if possible to avoid opening the ankle-joint.

The operation is performed by making a free horizontal incision over the convex border of the foot down to the bones, and a second smaller incision over the tubercle of the scaphoid on the concave border. With a periosteal elevator passed alternately through the external and internal incision, the tendons and other soft structures are raised from the tarsus. The elevator should be kept closely applied to the bones, so that the outer and inner tunnels may meet without the intervention of

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any fasciæ or strata, and there may be no chance of any tendon being left unraised below the passage. In my earlier operations I employed Davy's triangular director, in the grooves of which was worked an Adams' saw. In my later operations a chain saw was passed across the tarsus and worked through the bones, and then a second cut through the bones made in a similar manner, so as to remove a wedge with its base outwards. In one or two cases the bones were subsequently wired together; but this does not seem necessary. If all the tension is removed by dividing any tense structures from within the wound on the inner side of the foot, the parts are easily retained in the rectified position by the plaster-of-Paris dressing. The dressing and the plaster, after the removal of the astragalus in my later cases, have been kept on for from three weeks to a month, when the wounds have been found healed. No drain of late has been employed. Formerly a strand of pewter wire was introduced, but as this only tends to leave a sinus, unless the wound has been dressed for the purpose of removing the wire, it should be avoided if possible. In a few less severe cases than those in which a tarsectomy of some kind seemed to be necessary, I have employed Phelps's open incision, Parker's method of syndesmotomy, and Buchanan's operation of dividing all the soft tissues on the inner side of the sole subcutaneously down to the bones. I confess I have not had much experience of these operations, since it has hitherto seemed to me that cases in which by some they might be thought necessary could be cured by gentler means; and in the more severe cases in which they might have been employed, it did not appear in my judgment that they would be sufficient to meet the needs of the case, and that nothing less than attacking the bones would be successful in restoring the foot. In one case in which Buchanan's operation was done, a tarsectomy had subsequently to be performed.

Theoretically there would appear to be objections to Phelps's open method. These I have recently discussed elsewhere, so I need not enter upon them here. Since 1884 I find I have performed tarsectomy in some form or other twenty times. The results obtained by these operations have been satisfactory, but cannot for a moment be compared with the results obtained by gentler methods undertaken immediately after birth. It cannot be expected that a foot in which a portion of the tarsus has been removed is equal to a foot which has been restored to symmetry and usefulness with the bones intact. But the question is not one of tarsectomy *versus* tenotomy and mechanical extension. It is one, as I have said before, of merely making

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the best of a bad job. But a very good best is made of what before operation has in some instances seemed a hopeless condition. The foot has been rendered plantigrade and of a fair shape, and the patient has been enabled to walk with comfort and ease, and ultimately, as a rule, without the aid of irons. At first, while the parts are consolidating, some retaining apparatus, as after other operations on the foot, had better be worn.

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# FISSURE, NON-SYPHILITIC AND SYPHILITIC, OF THE RECTUM AND ANUS.

BY

D. H. GOODSALL.

## NON-SYPHILITIC FISSURE.

A typical fissure of the anus and rectum is a pear-shaped or triangular ulcer, situated as to its lower part over the inner margin of the external sphincter, and as to its apex over the lower border of the internal sphincter. The ulcer varies in length from three-eighths to seven-eighths of an inch, and in breadth from about a quarter to half an inch. The lower part is formed by the skin of the anus, the upper part by mucous membrane. The floor of the fissure in some cases is the partly torn through mucous membrane and anal skin, and in the other cases it is formed by the submucous and subcuticular connective tissue. In the latter cases the pale fibres of the external sphincter can be seen crossing the floor of the fissure or under it at right angles to its long axis. The margin of the fissure is well defined and regular, the sides, from the contraction of the sphincter, overlap the floor of the fissure, so that the full width of the fissure cannot be seen unless the sides are first drawn apart. At the lower border of the fissure, or on one side of it, there is sometimes a tab of skin, varying in length from less than an eighth to three-quarters of an inch; its width varies from less than an eighth to half an inch. A well-marked tab is seen in about one in every ten cases in men, and not so frequently in women.

On examining a patient suffering from fissure, the anal orifice will be found contracted and the patient rarely able to force the anus outward. He will attempt to do so, but the pain in the fissure caused by the attempt usually makes him at once desist. On separating the sides of the anus, the lower border of the fissure can be seen. On passing the finger into the rectum, it will frequently be found that both the external and the internal sphincters are contracted, and that the levator

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ani is also in a more or less irritable condition. The rectum will be found more or less full of fæces, although the bowels may have recently acted. On removing the finger from the rectum, the anus is often spasmodically drawn upwards.

The most definite symptom of a fissure is a burning, aching, or shooting and throbbing pain in the anus, coming on when the bowels are acting, or within half an hour to an hour after an action, and lasting from half an hour to six or eight hours or longer, and in a few cases until the next action of the bowels. The pain often ceases almost suddenly, and when the pain has ceased it seldom recurs until the next action of the bowels, except in syphilitic fissures, when it frequently returns at night. When a patient has only a fissure, the quantity of blood lost seldom exceeds one or two drops, and generally no blood is lost except the motion is very firm. Sometimes, even with a well-marked fissure, the prominent symptom is only irritation of the anus, coming on after passing motion, and occasionally after passing flatus.

The causes of fissure are constipation, eczema of the anus, and polypoid growths or polypus of the rectum, uterine enlargements and displacements; but even with eczema and growths, the bowels are almost invariably constipated. Very occasionally fissure is met with in patients who say that their bowels always act two or three times a day without medicine.

*Frequency of fissure.*—It is very generally accepted as a fact that fissure is more common in females than in males. In my experience fissure is met with in private patients in the proportion of six males to five females, and in out-patients at St. Mark's Hospital in the proportion of five males to three females. According to the St. Bartholomew's Hospital Reports, during the ten years ended December 31, 1890, thirty-one males and forty-six females were admitted for fissure; in St. Thomas's Hospital during the same period eleven males and twenty females. In the Westminster Hospital during the seven years ending December 31, 1890, nine males and ten females were admitted. The totals of these in-patient cases are—males, 51; females, 76, or two males to three females. This result is probably due to the fact that poor women are better able to afford the time required for in-patient treatment than men. Given a hundred cases of disease of the rectum and anus, there would be in the hundred cases in males about 7 per cent. of fissures, and in the hundred cases in females about 15 per cent.

The average age of patients suffering from non-syphilitic fissure is—males, 39 to 40 years; females, 35 to 36 years.

The position of the fissure in males is in about 91 per cent. of the cases on the posterior side of the anus, and just to the right or left of the middle line. In about 4 per cent. two fissures

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are met with, one on the anterior, and the other on the posterior side of the anus. In about 2 per cent. of the cases the fissure is on the anterior side of the anus. In females, in about 83 per cent. of the cases the fissure is on the posterior side of the anus; in about 8 per cent. on the anterior side of the anus; in about 8 per cent. one fissure is on the anterior, and the other on the posterior side of the anus.

Polypus and polypoid growths in the rectum when met with in fissure cases occur in males in about 11 per cent., and in females in about 22 per cent. They are almost invariably located within the last inch of the rectum, and are often either at the side of, or opposite, the fissure. Internal piles, when met with in fissure cases, occur in males in quite 20 per cent., and in females in 16 per cent. This occurrence of internal piles with fissure fully accounts for the loss of blood which takes place with some of these patients. In females one of the internal piles is almost invariably situated on the right anterior side of the rectum. Fistula is met with in fissure cases in males in 8 per cent., and in females in about 2 per cent. The fistula is either the blind internal or the complete, and is almost always on the posterior side of the anus; it is also generally a subcuticular fistula. Occasionally the fistula may pass under the mucous membrane at the upper part of the fissure, and then dip under the upper border of the external sphincter, and so form a blind internal fistula.

*Treatment of fissure.*—In all cases, unless the sphincters are much hypertrophied, or there are well-marked growths or internal piles or fistula, an attempt should be made to cure the patient by keeping the bowels open regularly once a day—the softer the motion the better—by keeping the part perfectly clean, and by lubricating the lower part of the rectum before each action of the bowels; for this purpose olive-oil may be injected, or cacao-butter suppositories may be used, at bedtime. After the bowels have been relieved, ung. resinæ, either alone or with an equal quantity of vaseline, is a most useful ointment for protecting the fissure and accelerating the healing. Should an operation be necessary, the most certain one is complete division of the external, and *only the external sphincter*. This is most conveniently done by placing the patient on his right side with the knees drawn up. The left index finger is then passed into the rectum, and the left thumb can then, in conjunction with the left index finger, make prominent the external sphincter, and also evert the fissure. The external sphincter should then be divided either through the floor of the fissure or midway between the posterior and the right side of the anus. One division of the external sphincter is sufficient, although the

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patient may have two or more distinct fissures. The external sphincter having been divided, any polypus, polypoid growth, or internal pile should be ligatured, if necessary, and removed. A small piece of dry cotton-wool should then be placed in the wound, and should not be removed until the bowels are allowed to act, about ninety-six hours after the operation.

All cases of fissure as above described can almost invariably be cured by this operation. The patient should keep his bed for nine days, and may follow his usual occupation after fourteen days, and then in many cases he will not know, so far as he can tell, that he is not perfectly well. Although he feels well, it takes on an average about ten weeks in males and about eight weeks in females before the wound is soundly healed. After the first action the bowels should be relieved once, and, if possible, *only once*, in every succeeding twenty-four hours. This object can be attained by using an enema (oij. to oiij.) of warm water every morning. A second enema should be used immediately after the first, should it not have freely relieved the bowels.

In cases of fissure without or with polypus or polypoid growths, the patient may be much more speedily cured by the forcible stretching of the external and internal sphincters. The stretching may, without any permanent damage to the patient, tear the fissure. After the stretching has been firmly continued for a few seconds, blood is usually extravasated under the skin posterior to the anus. This extravasated blood should not be interfered with. Should a polypus or polypoid growth exist in the case, it should now be removed, and a piece of dry cotton-wool should then be passed partly into the rectum, and should not be removed until the bowels are relieved, about ninety-six hours after the operation. For the first forty-eight hours there is some swelling, and much discolouration of the anal region, but by the end of eight or nine days they will generally have quite disappeared. The patient should keep his bed for a week, and may in ten or twelve days from the operation follow his usual occupation. The fissure, and any tearing of it, will generally be soundly healed within four weeks from the operation.

My experience of stretching the sphincters is much more limited than that of division of the external sphincter for the cure of fissure. The only objection that can be urged against division of the external sphincter is the very long time required for the healing of the wound. In other respects it is a most satisfactory operation; it leaves no permanent loss of power in the part; it completely cures the fissure, and the patient is not liable to a return of the disease.

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CASES OF SYPHILITIC FISSURE.

CASE I.—February 28, 1882.—J. S., aged 39, brickmaker.

Three fissures, one on the posterior, another on the left, and the third on the anterior margin of the anus. He has had fissure-pain for five weeks. He also has a sore on the left side of the prepuce; his femoral glands on both sides and his right inguinal glands are enlarged; he has mucous papules on fauces and tongue, and a rash on the chest. He contracted the disease about September 1881.

CASE II.—June 6, 1882.—A. B., aged 25, joiner.

One fissure on the right side of the anus; the inguinal glands on both sides enlarged. He contracted the disease six months ago, and since then he has had a sore throat. The sore was at the root of the penis.

CASE III.—November 1, 1882.—J. C., aged 23, boilermaker.

One fissure on the right and another on the left side of the anus. Inguinal glands on both sides enlarged. The patient says he had a sore on his penis and a rash on his body four months ago.

CASE IV.—December 20, 1882.—W. M., aged 27, sculptor.

Three fissures, on the right side of anus two, and on the left side one. Inguinal glands on both sides enlarged. Faint rash on the chest and the abdomen. Mucous papules on fauces. Contracted the disease about April 1882, when he had a sore on the penis.

CASE V.—August 8, 1883.—J. B., aged 42, sailor.

Two fissures, one on the posterior and the other on the left side of the anus. Inguinal glands on both sides enlarged, but more on the left than on the right side. No rash or spots on the body. No signs of syphilis either in the mouth or the throat.

CASE VI.—April 2, 1884.—E. S., aged 29, labourer.

One fissure on the posterior side of anus. Psoriasis on the head, face, and body. Inguinal glands on the right side enlarged. Sore on penis. Redness of fauces.

CASE VII.—June 25, 1884.—J. B., aged 38, pensioner.

Two fissures, both on the left side of the anus. Inguinal glands on both sides enlarged. No rash nor sore throat. Contracted syphilis in November 1883. Pain from fissures sometimes lasts for about nine hours after passing a motion.

CASE VIII.—July 21, 1886.—J. R., aged 42, fitter.

Two fissures, one on the posterior and the other on the left side of the anus, with a fold of œdematous skin posteriorly. A



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rash on the trunk and on the inner sides of both thighs. Inguinal glands on both sides, chiefly the right, enlarged. Mucous papules on the fauces. Orifice of prepuce indurated. Contracted syphilis about seven months ago.

CASE IX.—July 29, 1886.—Eliza F., aged 35, household.

Two fissures, one on the posterior and the other on the anterior side of anus. Inguinal glands on left side enlarged. Mucous papules on the fauces. She says she had a sore on the vulva three months ago. Never had either a child or a miscarriage. She is three months pregnant.

CASE X.—April 12, 1888.—Ada D., aged 30, household.

One fissure on the right side of anus. Inguinal glands on both sides enlarged. Mucous papules on the right side of the fauces. No rash on body. The pain in the anus comes on when the motion is passing, and lasts for about half an hour after the action of the bowel. The anus is painful at night.

CASE XI.—April 26, 1888.—Mary S., aged 21, trimmer.

One fissure on the left side of the anus. Inguinal glands on right side enlarged. Mucous tubercles on the vulva; an ulcer on the tongue.

*Signs of syphilitic fissure.*—In the majority of the cases there was more than one fissure, the left or the right side of the anus being the usual site. The fissures were situated over the inner border of the external sphincter, and were not so triangular or pear-shaped as the non-syphilitic fissures. When opened out, they bled more readily than the non-specific fissures; there was no other sign of syphilis of the anus or rectum. The average age of the patients was—males, 33 years; females, 29 years; as against males 40 years, and females 35 years, in non-syphilitic fissures. In all the cases, either the inguinal or the femoral glands on one or both sides were enlarged. The enlarged glands were freely moveable and painless; several of the patients appeared to be unconscious that the glands were enlarged.

As the notes of the above cases show, several of the patients had other signs of syphilis. All these cases were Hospital patients, and they were relieved of their fissures by the treatment for secondary syphilis. The length of the history of syphilis varied from four to eight months. The pain begins during an action of the bowels, and lasts generally not more than half an hour; it may recur, and often does, at night when the patient is in bed. A return of the pain before the next action of the bowels is the exception in non-syphilitic fissure.

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NOTES OF THREE

# CASES OF PROGRESSIVE MUSCULAR ATROPHY

ASSOCIATED WITH

## LOSS OF SENSATION TO HEAT AND COLD.

BY

F. E. BATTEN, M.B.

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Two of the following cases were admitted into Matthew Ward during the past year under Dr. Church, to whom I am indebted for permission to publish them.

The third case was admitted to the National Hospital under Dr. Bastian, to whom also I am indebted for permission to publish this case.

The interest of the cases lies in the fact that there is progressive muscular atrophy occurring in young subjects, associated with loss of sensation to heat and cold without any impairment to tactile sensation. In the one case in which a post-mortem was made, the cord presented dilatation of the central canal.

In many other respects the cases resemble the description of syringomyelia given by Gowers and other writers.

### Case I.

S. L., aged 22, bus-conductor, admitted to Matthew Ward, April 19, 1892, complaining of weakness of his right hand.

Four years ago patient had rheumatic fever, and dates his weakness from that time. He continued his work as bootmaker till twelve months ago, when his right hand became so weak that he had to give up his work and take to bus-conducting, which he continued till three months ago, when he had to give up even that work owing to the increasing weakness of right hand. He has noticed the wasting of the right hand for

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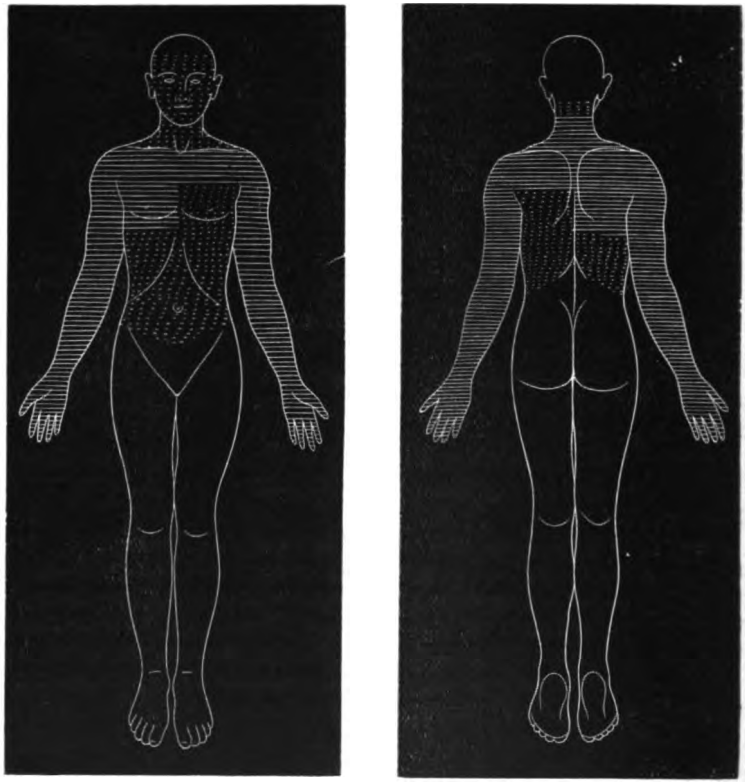
the last five or six months, and also that the hand had a great tendency to become cold, and when cold patient was unable to use it. Has suffered from headache at times. No vomiting. His appetite is good; for the last seven months has had some difficulty with micturition, having to answer the call at once. For last five weeks has noticed weakness of right leg.



CASE I.—In the charts, the horizontal lines represent loss of heat and cold sensation; the dotted line impairment of the same.

*Past history.*—Never very bright. Rheumatic fever four years ago; gonorrhœa six months ago. No family history of importance. Birth natural.

*Present condition.*—Well-nourished man; stupid, heavy expression. Head peculiar shape, being high in front, and gradually sloping down behind. Eyes: movements good in all directions; no nystagmus; pupils equal; react well to light and accommodation; discs natural. Articulation natural.

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Tongue protruded straight. Hearing good, equal on the two sides. Lungs, heart, and abdomen natural. Urine acid, sp. gr. 1010; no albumen; passed naturally. Bowels act naturally.

*Back.*—Marked lateral curvature to the right in the dorsal region; most marked at level of fourth and fifth dorsal vertebræ. Marked prominence of spinous processes from seventh dorsal to twelfth dorsal vertebræ. These vertebræ are tender on pressure.

*Arms.*—All movements capable of being performed.

*Shoulders.*—No wasting of muscles about shoulder-joint or upper portion of arms. Muscular power fairly good. Forearms: right is smaller than left; grasp of right hand much feebler than left. There is marked atrophy of muscles of thumb and of interossei of right hand; the left appears natural.

*Electrical reactions* show diminished reaction to Faradism in interossei, muscles of thumb, and abductor minimi digiti of right hand. React to galvanism, the KCC. being greater than the ACC.

*Legs.*—Walks fairly well. No muscular wasting. Right leg slightly weaker than left leg.

*Reflexes.*—Patellar tendons active, equal. No ankle clonus. Plantars active.

*Sensation.*—Tactile perfect all over the body; the finest touches being felt and correctly localised.

*Heat and cold.*—Sensation is absent all over the shaded areas, and diminished over the lighter shaded areas. Painful sensation follows the same distribution as heat and cold. Sense of position is perfect. A well-marked "tache" comes out very readily over the affected area, and is persistent for some time.

Patient remained in the Hospital till May 9th, when he was discharged practically in the same condition as when admitted.

Case II.—A. B., aged 22, admitted to Matthew Ward, July 8, 1892. Discharged soldier.

Eighteen months ago first noticed pain in right shoulder shooting down the arm; worse at night. Twelve months ago first noticed weakness of right hand; feeling of numbness first in the little finger.

In October 1891 discharged from the army owing to weakness of right arm, which he attributed to getting wet during the manœuvres of the previous summer. Four months ago he first noticed that his right leg was becoming weak, and soon after that his left leg was becoming affected.

Has had to strain to pass water for about two months.

Six weeks ago he first noticed wasting of the right hand.

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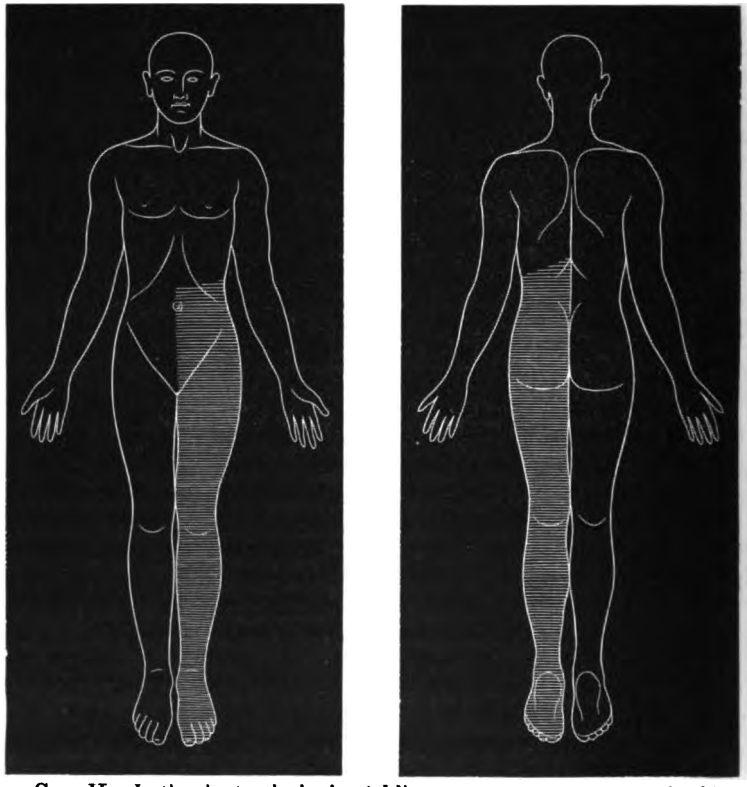
Has been a good deal troubled with constipation lately. Has had girdle pain at level of epigastrium; never difficulty in swallowing.

*Past history.*—Was in the army three years, and after being discharged acted as a porter. He always enjoyed good health up to onset of present illness. He denies having syphilis. No family history of importance.



CASE II.—In the charts, the horizontal lines represent loss of heat and cold sensation; the dotted line impairment of the same.

*Present condition.*—He is a tall, thinly-built man. His general condition is good; his gesticulation is natural. Tongue is protruded well and straight. Pupils react well to light and accommodation. Ocular movements good in all directions. Fundus natural. Facial movements are good. Palate moves naturally. Urine, sp. gr. 1010; no albumen.

*Back.*—Pain is referred to fifth dorsal vertebra. There is no

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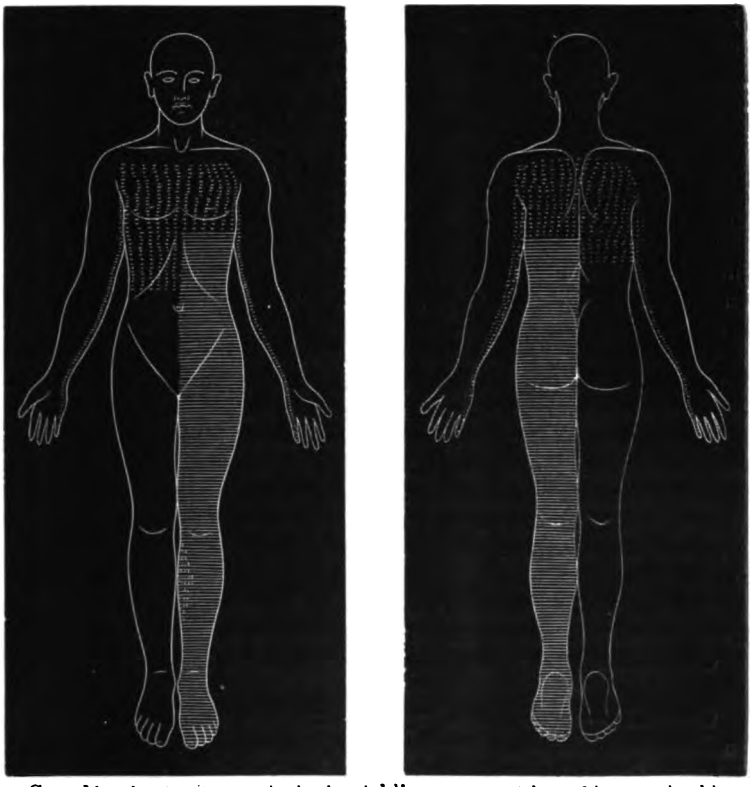
prominence and no tenderness over this or any other vertebra. No tendency to lateral curvature.

*Arms.*—All movements are capable of being performed. Slight tremor of right hand. Both arms are wasted, and muscles feel flabby; but the interossei and muscles of the thumb of the right hand are most affected; those of the left hand to a much less degree. There is marked weakness of the extensors



CASE 11.—In the charts, the horizontal lines represent loss of heat and cold sensation; the dotted line impairment of the same.

and flexors of the wrists. Grasp of left hand is stronger than right.

*Legs* are thin, and the measurements of the right are less than those of the left, the right leg being considerably weaker than the left. The gait is unsteady; unsteadiness slightly increased with eyes shut. The legs move in an incoördinate manner. Knee-jerks are exaggerated; much ankle clonus is

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present, most marked on the right side. Plantar reflex present, equal.

*Sensation.*—Tactile sensation is perfect all over the body, the lightest touches being felt and correctly localised. The distinction between heat and cold (water as hot as the hand could bear it and ice being used) was less over the shaded area. The application of a very hot test-tube or ice gave rise to a sensation which the patient named "hot pain." To pain, *i.e.*, pin-prick, there was diminished sensation over the same area. Pinching him gave rise to the same sensation of "hot pain." Sense of position was perfect.

*Electrical reaction* normal.

While in the Hospital he became gradually weaker. His grasp was much weaker in his left hand. He used to be up and walk about the ward till August 8, when he fell down. After that he used to have great difficulty in getting to his chair.

On August 25 he was quite unable to walk alone, and could not stand for any length of time. He was able to pass his water naturally, and his bowels acted regularly with the use of cascara sagrada.

On August 25th his sensation was again tested, and it was found that the impairment to heat and cold had greatly increased, the area being represented on the accompanying diagram.

At the same time there was impairment to tactile sensation over the inner side of the left leg below the knee.

His sense of position was now somewhat impaired in the left leg, he being unable to appreciate the position of his toes or ankle of the left foot. At times he had involuntary contractions of his legs.

While testing sensation a "tache" comes out very readily over the affected area, and is persistent for some time.

On September 3rd he was discharged from the Hospital.

Case III.—W. T., aged 23, tobacconist's assistant, admitted to National Hospital for the Paralysed and Epileptic, Queen's Square, December 30, 1891.

In February 1889 caught cold; suffered from bronchitis; soon afterwards objects seemed to dance before his eyes; he walked as if intoxicated; had weakness and tingling in his right arm; had some difficulty in swallowing liquids. After two months he improved, but his gait was still uncertain.

In October 1889 got worse; staggered very much more; and during the year 1890 was in Hackney Infirmary, and afterwards in the Metropolitan Hospital, where he underwent a full course of mercurial treatment. He has had no bladder trouble. He

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did not in any way improve, but got steadily weaker; complains of pain in left arm in the situation of an old fracture.

He had measles in 1882, scarlet fever in 1883, smallpox in 1884, fractured left arm and dislocated the elbow in 1886; denies syphilis. Was an only child; father dead, cause unknown.

No nervous disease is known in the family.

*Present condition*, January 1, 1892.—Fat, puffy-faced man; looks older than he is; stoops a good deal; has cold clammy hands. Eyes, constant nystagmus in vertical direction; pupils equal, react to light and accommodation; discs natural. Facial movements good. Tongue protruded straight.

All movements of the right arm can be performed; marked wasting of muscles of thumb.

Right trapezius much wasted, causing the right shoulder to be on a lower level than the left. Shrug of right shoulder weaker than the other. Scapula displaced outwards.

The grasp of the right hand is the stronger, but the weakness of the left hand is due to the injury about the fore-arm and elbow. Fibrillar twitchings in muscles of the right thumb, accompanied by some atrophy of thumb muscles.

The movements of the left arm above the elbow-joint good. In fore-arm there is very little power of flexion of the elbow-joint, or of supination or pronation of the hand, and the grasp is very feeble. No incoördination of movements.

Walks unsteadily; special weakness and stiffness of left leg; stands unsteadily, more so with eyes shut.

*Legs.*—No wasting; sense of position good. Knee-jerks active, left greater than right. Ankle clonus obtained on left side, not on right. Plantars present, right is greater than left.

*Sensation.*—Great blunting of sensation all over the left arm and thumb to the lower border of the fifth rib in front, and to the spine of scapula behind, reaching to the middle line, and extending upwards to the level of angle of the jaw.

Heat and cold sensation not tested.

On February 26, 1891, his condition was much the same.

*Lungs* natural. *Heart*, systolic murmur at the apex.

*Arms* remain in same condition; considerable weakness of right trapezius. Fibrillar twitchings in muscles of right thumb.

*Back.*—Marked prominence at the level of the fifth dorsal vertebra; no pain or tenderness on heavy percussion. Marked lateral curvature in the dorsal region, greatest deviation at about the sixth dorsal vertebra, convexity to the right.

On the right elbow is a scar which looks like the result of an old burn. The patient states that five years ago a blister rose there, which had been caused by placing his elbow on a

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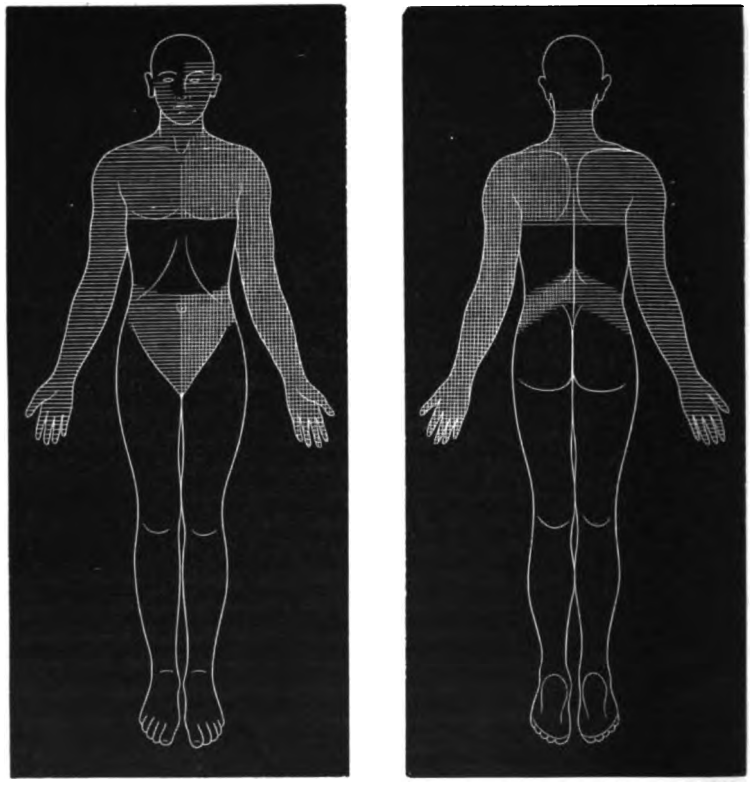
rail by the fire, which was hot; but it gave rise to no pain at the time.

Gait very unsteady; difficulty in turning; walks with legs far apart. Knee-jerks well marked; no ankle-clonus obtained in either foot. Plantar reflexes present.



CASE III.—In the charts, the horizontal lines represent loss of heat and cold sensation; the dotted line impairment of the same.

*Sensation.*—There is complete loss to heat and cold sensations over the area shaded with horizontal lines. Loss to pain over the same area.

Loss of touch over the area shaded with vertical lines.

February 26th, he had regurgitation of fluid through the nose, and on the following day it was noted that his palate was raised normally, though a previous note is to the effect that the palate acts feebly.

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On March 2nd, while in the ward, he took the kettle off the fire to make tea. Having made tea, he replaced the kettle.

On the following morning there was a large blister extending right across the palmar surface of the hand, where the handle of the kettle had been. From the burn he suffered no pain. The burn healed in about fourteen days.

He remained in same condition to March 28th, when he became very short of breath; had well-marked pericardial friction; signs of general bronchitis; no consolidation; temperature 105°. He gradually got worse; fluid accumulated in both pleuræ, and the patient died on April 18th.

*Post-mortem.*—Spinal cord appeared a good deal larger than normal, especially in the cervical region. On cutting across the cord, a cavity of considerable size was seen filled with clear fluid. The dilatation extended up to the fourth ventricle; the *iter* was also dilated. The cavity appeared a true dilatation of the central canal, being at least a quarter of an inch in diameter in the cervical region. The cavity became gradually smaller, and the canal appeared of normal size in lumbar region. The vertebræ from the fifth to the ninth dorsal were examined, there was no disease of the bone, the curvature was well marked.

The lungs were congested; the bronchi injected and filled with purulent secretion. Some fluid in both pleuræ.

Heart: no evidence of pericarditis.

*Summary.*—Case No. I.—A young man, aged 22; progressive muscular weakness and later atrophy of muscles of one hand, lasting over a period of four years, associated with loss of thermo-sense over a considerable area of the body, without any corresponding loss of tactile sensation. Scoliosis of the dorsal region, and prominence of certain spinous processes, with a marked vaso-motor disturbance over the affected area, as shown by the presence and persistence of the tache.

In Case No. II.—A young man, aged 22; progressive muscular weakness, and later atrophy of muscles of thumb of one hand, of about one year's duration, associated with loss of thermo-sense over a large area of the body, without any corresponding loss of tactile sensation, with marked vaso-motor changes over the affected area, as shown by the presence and persistence of the tache.

In Case No. III.—A young man, aged 23; progressive muscular weakness and later atrophy of right arm, extending over a period of two years, associated with loss of thermo-sense over a large portion of the body, with complete loss of sensation

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over one arm, with well-marked scoliosis, and prominent spinous processes affecting the dorsal region of the back.

The fact that he burnt his right arm five years ago points to the long duration of the thermo-anæsthesia, and the fact that he burnt his hand while in the ward without pain shows the completeness of the loss of thermo-sensation.

Marked vaso-motor disturbance, as shown by the readiness with which the tache was produced and the length of time it persisted.

The post-mortem examination revealed a condition of the cord, viz., dilatation of the central canal, which had been suspected from the symptoms during life.

We have, then, three cases of progressive muscular atrophy occurring in *young men* all under the age of twenty-four, the weakness and atrophy coming on gradually, and extending over a period of from one to four years, associated in all these cases with loss of thermo-sense over some part of the body, and always involving the trunk, without any corresponding loss of tactile sensation.

Marked vaso-motor changes in all three cases.

Scoliosis and dorsal prominence being well marked in two of the cases.

The legs being markedly affected as regards loss of power in two of the cases, and to a lower degree in the third case.

In the one case in which a post-mortem examination was made, dilatation of the central canal of the spinal cord was present.

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# A PAGE IN THE LIFE-HISTORY OF SPROUTING ENDOCARDIAL GROWTHS.

BY

W. AINSLIE HOLLIS, M.D.

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Two cases recently under my observation at the Sussex County Hospital illustrate some obscure phases in the life-history of the warty fibrinous growths found upon the heart's cusps in infective endocarditis. I shall first briefly narrate the history of each case, for the full notes of which I am indebted to Dr. Maynard, the House-Physician. I shall subsequently draw attention to certain characteristic features, which make each case unquestionably a valuable clinical and pathological study.

CASE I.—George K., a strolling player, aged 44, belonging to Brighton. Admitted May 3, 1892.

The patient had enjoyed fairly good health until January last. There was, however, a history of hæmoptysis eleven years previously, but he continued his occupation, that of clarionet-player in a band of negro minstrels, until the beginning of the year. He then had the influenza, and he has been laid up with shortness of breath and pain in the left side of the chest since that date. There was no history of rheumatism, nor of syphilis, and the family history was good.

On admission, the patient was cyanosed and had a short hacking cough. The finger-nails were clubbed and bluish. Temperature was subnormal. Pulse 100, sharp, and badly sustained. Urine scanty, sp. gr. 1009, free from albumen.

Breath sounds were heard over the præcordia. Heart's apex-

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beat not perceptible; there was no thrill. A loud systolic murmur, probably mitral, was heard at the angle of the left scapula and in the axilla. A double aortic bruit was audible in the second right intercostal space. Lungs emphysematous. Expiratory murmur prolonged. The percussion-note impaired, with diminished breath and voice sounds at both bases. Expectoration scanty and frothy. The liver was felt below the costal margin. There was no ascites nor œdema upon admission. About a month subsequently his feet and legs began to swell; at the same time a purpuric rash extended over the skin of the lower extremities. The shortness of breath meanwhile was particularly distressing at night, and sleep was consequently much broken. The temperature remained subnormal and the urine scanty. On the 8th of June he had a severe attack of cardiac angina, which drugs failed to relieve. On the night of the 12th he became noisily delirious, and lay in a dazed condition during the day. During the previous twenty-four hours only six ounces of urine were passed, non-albuminous and of a low specific gravity.

On the 16th of June, the day before his death, he had a series of epileptiform attacks. One of these, observed by Dr. Maynard, began with twitching of the face and extremities on the left side. The right side was subsequently involved in clonic spasm. During the fit the face was livid and the respirations stertorous. The patient was unconscious during the attacks, and for some time afterwards; indeed, it is doubtful whether he regained consciousness before his death.

At the autopsy, fibrous emboli were found in the basilar, in both middle, and in the left anterior cerebral arteries. The first branch of the left middle cerebral artery was nearly occluded by a tough cartilaginous spigot-shaped mass loosely adherent to the arterial walls. No brain-softening was observed. There was considerable hypertrophy of the heart, with some dilatation. The aortic valves, in two instances, were converted into a fringe of three or four calcareous pea-like masses, suspended by short remnants of fibro-cartilage from the surface of the artery. The third cusp was fringed along the free edge with soft sprouting growths. The remaining cardiac valves were healthy. Besides showing evidences of congestion, the kidney-cortex was diminished in amount and granular. The left kidney contained a whitish yellow mass, spheroidal, not conical, in shape, and extending from the capsule to the pelvis. There was a small hæmorrhage into its substance. Under the microscope the new growth appeared to consist mostly of fibrous tissue, compressing and ultimately destroying, the normal renal structures

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at the part. Numerous highly refractive granules and rods were scattered through the growth, especially at the edges (see Figs. 1 and 2).

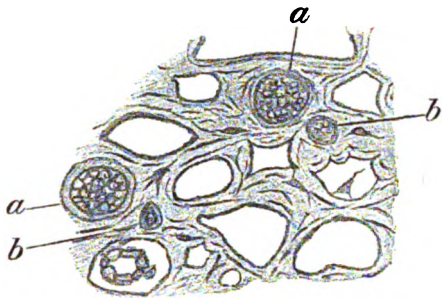


FIG. 1.—Section through the centre of kidney-growth, showing the increased fibrous tissue (shaded); the cut ends of the shrunken urinary tubules are denuded of epithelium; *a*, *a*, *b*, *b*, the cross sections of newly-formed blood-vessels.

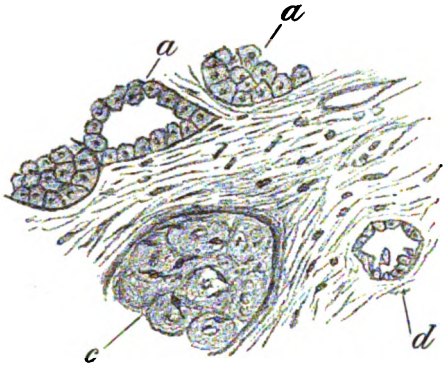


FIG. 2.—Section through periphery of same; *a*, *a*, tubules becoming invaded by (*b*) fibrous growth, (*c*) Malpighian capsule, and (*d*) tubule undergoing degeneration.

CASE II.—Eliza C., aged 50, married, three children, several miscarriages, belonging to Horsham. Admitted June 11, 1892.

Two years ago she had influenza, and had not felt strong since the attack. Present illness began with "pains in the legs" and vomiting, without diarrhœa, about six weeks ago. The skin was occasionally yellowish; no marked jaundice. Husband delicate. No personal nor family history of rheumatism.

On admission, the patient complained of great weakness, and of sharp pains in the legs when she attempted to stand. Body poorly nourished. Face pallid. No abnormalities to be seen or felt on legs. Knee-jerks normal. No joint-swelling nor irregularities along the shin-bones. Tongue furred, edges indented.

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Bowels regular; motions natural both in consistence and colour. Pulse regular. Urine free from albumen and bile.

The edge of the liver was felt about two inches below the costal margin, bulging forwards as a distinct hemispherical tumour below the ribs. The temperature chart from June 11 to June 26 inclusive (see Table) showed two febrile exacerbations daily, mostly at 6 A.M. and at 6 P.M. For a week afterwards the temperature was sub-normal. It then rose again with two irregular exacerbations daily till death.

| June | 11. | 12. | 13. | 14. | 15. | 16. | 17. |
|---|---|---|---|---|---|---|---|
| 2 A.M. | ... | ... | ... | 99.8° | 100.0° | 100.2° | 100.8° |
| 6 A.M. | ... | ... | ... | 100.2° | 100.8° | 100.0° | 99.8° |
| 10 A.M. | ... | 99.4° | 99.0° | 100.6° | 98.6° | 102.2° | 99.0° |
| 2 P.M. | 100.0° | ... | ... | 101.2° | 99.8° | ... | 100.8° |
| 6 P.M. | 99.6° | 102.0° | 102.2° | 99.4° | 101.2° | 98.2° | 102.4° |
| 10 P.M. | ... | ... | ... | 100.2° | 102.6° | 101.0° | 101.2° |

| June | 18. | 19. | 20. | 21. | 22. | 23. | 24. |
|---|---|---|---|---|---|---|---|
| 2 A.M. | 100.0° | 99.4° | 99.0° | 98.6° | 98.2° | 100.2° | ... |
| 6 A.M. | 99.8° | 100.4° | 98.6° | 99.5° | 99.2° | 100.8° | ... |
| 10 A.M. | 99.8° | 97.8° | 99.6° | 101.5° | 98.6° | 102.0° | 100.0° |
| 2 P.M. | ... | 100.6° | 101.0° | 101.5° | 99.6° | 98.6° | 100.6° |
| 6 P.M. | 101.4° | 101.0° | 101.0° | 100.8° | 100.4° | 99.2° | 102.4° |
| 10 P.M. | 101.0° | 99.8° | 102.2° | 100.2° | 98.6° | 100.0° | 101.4° |

The patient continued in much the same condition as on admission, gradually losing ground perhaps, until the beginning of July, when an aspirating needle was inserted into the liver at the most prominent point, and a small quantity of semi-solid material withdrawn, which consisted apparently of broken-down liver cells and leucocytes. The tumour shrank somewhat afterwards. Her general condition, however, became worse. She had several fainting fits. The pulse grew rapid and fluttering. She lost the control of her sphincters, and sank into a condition of mental hebetude.

On the 12th of July Dr. Willoughby Furner decided, with my concurrence, to make an exploratory incision through the abdominal walls. He subsequently opened the gall-bladder, and removed therefrom six or eight faceted gall-stones about the size of small marbles, together with a soft pultaceous mass, consisting mainly of inspissated bile and mucus. The patient never rallied after the operation, but died about seventeen hours afterwards.

The autopsy was made twenty-six hours after death. Weather warm. There was considerable cadaveric discolouration of the

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integuments. A wound to the right of the middle line extended through the abdominal walls from the costal margin vertically 3½ inches downwards. The edges of the gall-bladder were adherent to the sides of the wound. Both lungs were œdematous; the middle lobe of the right was of a greenish-brown colour. Emboli were found in both pulmonary arteries, extending into the first and second ramifications. These clots were pale, tough, and firmly adherent to the arterial walls, and the vessels were nearly occluded thereby.

The heart-cavities were distended with dark watery clots. Muscular tissue apparently normal; no hypertrophy. The aortic cusps had pliant cauliflower-like vegetations on their free edges. No thickening nor puckering of the valve-curtains. The right lobe of the liver was considerably enlarged, extending

FIG. 3.—Section through one of the liver bosses. At the top are seen several large cells of an epithelial columnar type, projecting from a fibrous stroma. *a*, *a'*, loculi stuffed with cells. *a'*, cells undergoing fatty degeneration.

downwards several inches below the costal margin. Its upper surface presented two bosses not well marked externally. On section these were found to be circumscribed, but not encapsuled, tumours about an inch across, soft, pale, and exuding blood-stained juice. The remainder of the liver was paler than natural, and of a peculiar spongy texture. The gall-bladder was sutured to the parietal peritoneum. Its walls were greatly thickened, and in its cavity a quantity of shreddy material was found. A large gall-stone blocked the cystic duct. No bile was found in the gall-bladder, nor was the viscus bile-stained. Both hepatic ducts were healthy and bile-stained. The wall of the gall-bladder was in one part apparently the seat of a new growth in the submucous tissue. One or two enlarged glands were found in the adjacent mesentery. There was no peritonitis.

The capsules of the kidneys were stripped off with difficulty,



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and left the surfaces irregularly pitted. The cortex was diminished. The cut surface presented a mottled appearance, consisting of congested patches separated by pale streaks.

Under the microscope the new growths were seen to consist of cellular and fibrous elements. The cells were large, and

FIG. 4.—Liver tumour débris. A few bacilli and micrococci were visible, though unstained.

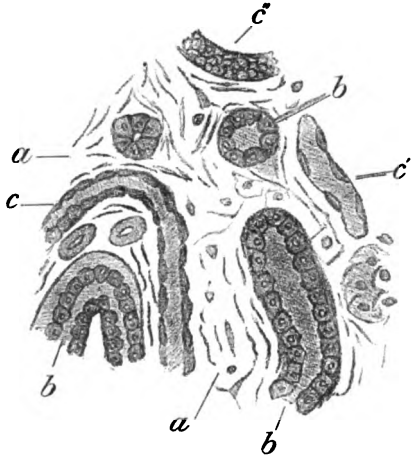


FIG. 5.—Section of kidney; *a*, *a*, *a*, increased fibrous tissue; *b*, *b*, divided tubules; *c c' c''*, blood-vessels; *c'*, a newly-formed vessel; *c''*, one obstructed by clot.

*N.B.*—The sections were mounted in Farrant's solution after staining with carmine by Dr. E. Maynard, and drawn from nature by myself.

Figs. 1, 2, 3, and 5 are magnified about 230 diameters; Fig. 4, about 540 diameters.

mostly of a columnar epithelial type (see Figs. 3 and 4). The remainder of the liver was extremely fatty. There was an excessive amount of fibrous tissue in the kidneys, and numerous capillary emboli (Fig. 5).

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In the following remarks, I shall not take the cases in their chronological order, but shall consider the second case first, for reasons which will be evident subsequently. The case was one of some obscurity during the lifetime of the woman, as the tumour in the region of the liver, to which most of the prominent symptoms were ascribed, led me unfortunately to overlook the condition of the heart, which the autopsy revealed. It may be useful to begin by inquiring in what order the various organic lesions occurred.

There is undoubted evidence in the detailed description of the gall-bladder and its duct that the formation of gall-stones had been slowly going on for a long period. We may, I think, safely assume that these pathological concretions were in existence before the walls of the gall-bladder became unduly thickened and its cavity partially filled with the shreddy material above mentioned. Again, the size, and, judging from the clinical evidence, the comparatively slow growth of the bosses in the liver, their proximity to the gall-bladder, and their histological characters, lead me to conjecture that these centres of disease arose at an early stage in the history of the case, yet subsequently and in succession to the thickening of the mucous membrane of the gall-bladder and its duct. At what period in the chain of pathological events the kidneys and the heart became implicated is difficult to determine. The former organs in parts showed structural proofs of old-standing fibrosis, whilst elsewhere the state of the smaller blood-vessels suggested the formation of recently infected spots. The clinical notes of the case do not help us as regards the condition of the patient's heart during the last weeks of her life. There is, however, the statement that she suffered from several attacks of syncope, and had a rapid, fluttering pulse, which may be taken to indicate serious cardiac embarrassment, some ten days or so before her death. Fortunately the appearances observed at the post-mortem examination, and above recorded, will materially assist us in the present inquiry. The seemingly healthy condition of the cardiac muscle, the absence of any marked hypertrophy or dilatation of its cavities, and the suppleness of the fibrous growths on the cusps, favour the assumption that the heart was smitten *after* the other organs I have mentioned. The clots in the pulmonary arteries were secondary to the cardiac lesion. If I have interpreted the facts of the case correctly, the various organs became infected in the following order:—(1) Gall-bladder; (2) liver; (3) heart; (4) pulmonary vessels.

A peculiar element of this case, and one of some histological importance, obtains in the existence of a fibrinous endocardial

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growth along with hepatic tumours, having many of the macro- and microscopical characteristics of the carcinomata. If we admit the facts as correctly recorded, and I do not see how we can with advantage dispute them, we are placed in the following apparent dilemma in attempting an explanation. We must either contend that it is possible for two different diseases, namely, cancer and infective endocarditis, to progress *pari passu* in one and the same patient, or we can assume that these disorders are only different phases of one disease, and, although the new growths in the above case are structurally dissimilar, that they really owe their origin to the same cause.

I do not here wish to enter the lists as the champion of any particular hypothesis regarding the origin of the cancers, nor do I feel capable of undertaking a bacteriological inquiry concerning the micro-organisms inhabiting the blood-vessels in infective endocarditis. My desire has been only to give an unbiassed record of an interesting case, and to call attention to some of its peculiarities. The existence of malignant disease of the gall-bladder and liver in association with gall-stones is not an unknown coincidence. Zenker[1] has described eight such cases (all women) of primary cancer of the gall-bladder, and Musser[2] has tabulated a hundred cases. Two-thirds of the cases were in women, and he considers that gall-stones are a direct exciting cause of cancer in patients who have a predisposition to the disease. On the other hand, Rothmund[3] has a record of thirteen cases of ulcerative endocarditis, under the care of Professor Eichhorst, of Zurich, during the five years 1884–89, wherein two only (Cases XI. and XIII.) were associated with gall-stones. I cannot, however, meet with a case fairly on all fours with the one I have narrated above. If we look to the temperature chart for enlightenment, we shall probably favour the view that the new growths in the liver partook of the characters rather of septic infarcts than of cancerous nodules in their pathological behaviour, yet histologically their affinity to cancer was conspicuous.

Having finished for a time with Case II., which tells us how these warty endocardial growths may occasionally arise, I shall briefly refer to Case I. as illustrating locally the further progress and the occasional termination of these growths and their metastases.

Physical signs of long standing heart-disease were present in this patient on the day of admission. In the post-mortem examination we found further evidence of old cardiac trouble. The

[1] Arch. f. kl. Med., Bd. 44, Hft. 2, 3.
[2] Boston Journal, December 5, 1889.
[3] Inaug. Dissert., Zurich, 1889.

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calcified remnants of the two aortic valves may, I take it, have represented a degenerative form of the soft warty growths which still sprouted on the third cusp. These hardened tufts had long ceased to sprout, and had so far lost their potential energy for evil—a termination to an attack of infective endocarditis, which, although a rare one, is, as this case demonstrates, a possible termination, and one the physician must bear in his mind when he is forming a prognosis.

The small plug of fibro-cartilage in the left middle cerebral artery could not have originated recently. The position of the nodule at the entrance of the first branch of the artery does not invalidate this conclusion, for the neoplasm did not at any time occlude the vessel, otherwise some evidence would undoubtedly have been forthcoming at the autopsy of softening or of other degenerative changes in the adjacent brain-substance, and this was not the case. I imagine that the plug, by its loose attachment to the arterial walls, acted the part of a floating valve, which was driven to and fro at each pulsation, and that it did not seriously interfere with the blood-current through the vessel. If we inquire whence this obstruction first arose, we shall possibly be carried back to a period antecedent to the petrifaction of the stony aortic cusps, when they too supported pliant fringe-like growths upon their supple curtains, as did the third at death. This spigot-shaped fibro-cartilage was, belike, the descendant of a soft warty growth, washed whilom from a cardiac valve.

If the formation of an intra-vascular plug of fibro-cartilage is an occasional outcome of metastasis in infective endocarditis, the production of fibrous clots is a far commoner one. I wish to call attention to the existence of two probable varieties of fibrous metastasis, the atrophic and the trophic forms. When the nutrient vessel of a part is suddenly blocked, and the blood-current diverted thereby, if the tissues survive the first shock of the disaster, the malnutrition produces shrinkage and atrophy of all special structures in a part so implicated, whereas the fibrous elements may be somewhat increased. These changes eventually produce a pitting or a puckering at the seat of injury. The kidney cortex in Case II. showed many such depressions. The trophic variety of fibrous infarct, although originating possibly in a similar manner to the other variety, is, owing to anatomical or other local causes, never completely cut off from the blood-stream. Consequently, the infected part thrives after its own manner; that is to say, whilst the fibrous network, with its newly-formed vessels (see Fig. 1), grows and battens, the proper tissues of the part are starved. This tumour grows peripherally, and does not apparently shrink at any time, as does the other kind.

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OBSERVATIONS UPON

# THE PULSE-RESPIRATION RATIO IN CROUPOUS PNEUMONIA.

BY

SAMUEL WEST, M.D.

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The alteration of the pulse-respiration ratio in croupous pneumonia is rightly recognised as one of the most prominent characteristics of the disease, and is often of great diagnostic importance in cases of difficulty. The ratio in health being about 4.5 to 1, drops in pneumonia to 3 or 2 to 1, and may fall even below this. The altered ratio, however, though characteristic, is not pathognomonic; for it sometimes occurs, and may be equally marked, in rheumatic pericarditis and in acute pleurisy.

The study of this ratio in a series of cases of pneumonia has revealed a good many other points of interest and importance, which I purpose to deal with in this paper.

The cases are arranged in groups, and the necessary comments are made on each in passing.

A. *Cases which recovered:—*

1. Ordinary cases in the adult:—

$$\frac{P}{R} = \frac{120}{40}\ \frac{120}{52}\ \frac{120}{64}\ \frac{112}{36}\ \frac{112}{60}\ \frac{136}{40}\ \frac{138}{60}$$

It is true that a respiration rate above 40 in the adult is of grave omen, still it is not incompatible with recovery. Persistent bronchitis does not affect materially the P.R. ratio when pneumonia develops.

Before the pneumonia, $\frac{P}{R} = \frac{88}{20}$

With the pneumonia, $\frac{P}{R} = \frac{140}{40}\ \frac{120}{40}$

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2. Instances in which the pulse was unusually slow, the respirations being accelerated as usual:—

$\frac{90}{54}$ under 2, $\frac{88}{38}$ with temp. of 104°, $\frac{100}{40}$ $\frac{108}{48}$

3. Instances in which both pulse and respiration were unusually slow, and that with extensive pneumonia:—

$\frac{56}{25}$ $\frac{52}{20}$ $\frac{50}{18}$

4. Instances in which both pulse and respiration were unusually rapid, this being exceptional in adults and the rule in children:—

In adults, $\frac{160}{52}$ – $\frac{140–160}{50}$ $\frac{160}{62}$ $\frac{160}{80}$ (2).

In children, $\frac{132}{76}$ (under 2), $\frac{160}{56}$ $\frac{180}{72}$

B. *Cases which ended fatally.*—They show the gradual increase in both pulse and respiration as the end was approached:—

(1.) $\frac{116}{48}$ $\frac{120}{52}$ $\frac{132}{60}$ D.

(2.) $\frac{120}{40}$ $\frac{136}{48}$ $\frac{176}{60}$ D.

(3.) $\frac{112}{36}$ $\frac{120}{50}$ $\frac{130}{72}$ $\frac{136}{70}$ D.

In a case of malignant disease of the œsophagus the normal ratio was $\frac{38–48}{18}$; when pneumonia set in it became $\frac{88}{44}$ $\frac{86}{42}$, and the patient died after three days' illness.

The altered ratio even continues for some time during convalescence, for though with the cessation of fever the pulse and respiration both fall, still the pulse falls more rapidly than the respiration, and at the crisis the drop in the pulse may precede by some hours that of the respiration, and may be the earliest indication of the approaching crisis; but this fall in the pulse rate is not always of good omen.

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*Pulse and Respiration Ratio during Fever and Convalescence.*

| | Fever. | About Crisis. | Convalescence. | Remarks. |
|---|---|---|---|---|
| 1. | 130/42 | 96/48 | 72 68 68 / 30 28 24 | |
| 2. | 120/44 | 80/44 | 72/50 two days after. 56/26 five days after. | (1½) |
| 3. | 144–160 130/60 64 | 100 112/50 36 | 80/36 | |
| 4. | 120/54 | 96/40 | 60 80/36 28 (under two). | |
| 5. | 120/42 | 48–58/30 | 64/24 | This case shows a remarkable drop in the pulse at the crisis. |

The next case shows the long persistence of a slow pulse during convalescence:—

| | Fever. | | Convalescence. |
|---|---|---|---|
| 6. | 120/48 | ... | 84 64/34 24 for three weeks. |

The following cases show the gradual rise to the normal ratio as convalescence advances. The first two are also instances of a relapse, or of a second attack following a day or two after the first crisis:—

| | Fever. | | Convalescence. |
|---|---|---|---|
| 7. | 1st attack 136 120/52 52 | ... | 80/40 |
| | 2nd attack 110 124/52 62 | ... | 80 60 68 72/36 24 25 24 |
| 8. | 1st attack 120/52 | ... | 84/30 |
| | 2nd attack 116/50 | ... | 78 78 80 96/30 24 24 20 |
| 9. | 104/56 | ... | 70 52 68, 72, 82, 88/40 32 24 |

In the last case I quote, the slowness of the respirations at first made the diagnosis of pneumonia doubtful, but in a day or two they rose to 40, and the physical signs were then characteristic, as was the subsequent course of the attack:—

| | Fever. | | Convalescence. |
|---|---|---|---|
| 10. | 126 108 96/24 32 40 | .. | 64/24 |

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# THE SURGICAL TREATMENT OF HYDATIDS.

BY

F. C. WALLIS.

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Whilst in Australia I had opportunities of seeing many cases of hydatid disease, which is very common in that land.

In many cases the effect of treatment was anything but satisfactory, and although out of the large number of cases that came under my notice many went away benefited, temporarily, at all events, one could not help feeling that the treatment might be much improved upon. Since that time, 1886–87, much has been written concerning this disease, and the methods adopted for its cure have been greatly improved, with correspondingly better results.

The two most common methods of treatment were (1) the introduction of a trochar, with or without an aspirator, partially or entirely evacuating the cyst, and trusting to the chance of its not refilling; (2) a free incision over the tumour, emptying the cyst, and removing the cyst-wall.

Other methods of treatment, such as injections of various chemical bodies, destruction of the parasite by electricity, treatment with the *canule-à-demeure*, or by caustics, have all been employed, but the results obtained by these methods were most unsatisfactory, and these methods have now become practically obsolete.

I intend in this paper to confine my attention to the first two methods mentioned.

Hydatids are found more often in the region of the liver than elsewhere; then in the thorax; a certain number have occurred in the brain; and, finally, they may occur anywhere.

Taking the most common site first, viz., the under surface of the liver, I find a large number of cases have been recorded in which both of the above methods of treatment have been adopted.

The use of the trochar as a curative measure is, in my opinion, extremely bad. It is not unfrequently fatal, always dangerous, never reliable.

It is difficult to account for the extremely sudden onset of

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fatal symptoms and the rapid deaths that from time to time have occurred when liver hydatids have been punctured with a trochar.

There are two causes to which this may be ascribed—first, reflex or "shock;" second, some active poison in the hydatid fluid, which takes immediate action on the heart or respiration.

Taking the first cause, "shock," it is quite possible that in a broken-down individual with a weak fatty heart, the shock, preliminary agitation, &c., may be sufficient to cause a fatal issue; but in an ordinarily healthy individual with a liver hydatid—and the subjects of hydatid disease are generally quite healthy in other respects—this does not seem probable, and hence one must look to the second cause, viz., some active poison in the hydatid fluid.

Looking at the accompanying Table by Davies Thomas of

| Percentage of | Hayem. | Jacobson. | Munk. | Wyse. | Heinty. | Scherer. |
|---|---|---|---|---|---|---|
| Water | 97.9 | ... | 98.426 | 98.59 | 98.675 | 93.476 |
| Solid constituents, consisting of organic matter | ... | ... | 1.574 | 1.410 | 1.324 | 6.523 |
| Sugar | ... | 0.060 | 0.606 | 0.546 | ... | ... |
| Leucin | ... | considerable amount | ... | ... | ... | ... |
| Succinic acid | ... | 0.700 | uncertain | ... | 0.341 | ... |
| Inosite | ... | ... | 0.041 | ... | ... | ... |
| Urea / Creatin | ... | ... | uncertain | ... | ... | ... |
| Mucus | 0.18 | ... | ... | ... | ... | ... |
| Albumen | 0.4 | ... | ... | ... | traces | ... |
| Inorganic matter | ... | ... | 0.968 | 0.864 | ... | 1.061 |
| Sodium chloride | 0.53 | 0.6140 | 0.61 | 0.482 | .385 | ... |
| ,, phosphate / ,, sulphate / ,, carbonate | 0.7 | 0.230 | traces | ... | ... | ... |

the constituents of normal hydatid fluid, there seems to be very little else in the fluid but water and a small amount of sodium salts; so that, if these analyses are correct, one is again met with the question, "What is this active poison?" That there is such a poison seems fairly clear from the urticaria-like eruption, known as the hydatid rash, which generally follows very rapidly after tapping abdominal hydatids.

Laurence Humphry, in the *Lancet*, August 15, 1887, reports a case of liver hydatid which was tapped and followed by distressing symptoms immediately after the puncture, which was hardly felt, and *half an hour* afterwards a profuse irritable urticaria appeared.

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Many such cases might be quoted where a rash rapidly appeared after tapping.

In the same contribution Humphry gives a summary of some experiments by Professor Roy on various dogs, and the deduction drawn by the Professor was "that there is in hydatid fluid some substance which has a powerful effect on both the heart and respiratory mechanism."

Graham in his book gives some similar experiments on two dogs. He injected hydatid fluid into the peritoneal cavity, and also hypodermically, but with no bad results whatever to the animals experimented upon, so that he was unable to satisfy himself that there was any poison in hydatid fluid.

In Bryant's fatal case (Clinical Society's Transactions, vol. xi.), the trochar had perforated the portal vein, which would in itself produce a fatal result, so that it does not help much with this question, although it illustrates another grave risk in using the trochar for these cases.

Whether there is a poison or not, the fact remains that when a trochar is used in liver hydatid a rapidly fatal issue may result.

Now, when a hydatid has been *incised*, I have never seen an immediately fatal result, and I cannot find a single recorded case of one. About deaths occurring after abdominal incisions, I shall have more to say later on. The cyst-wall of a living hydatid is an extremely delicate membrane, varying in thickness, but generally not more than one-eighth of an inch thick, sometimes less than this. If a trochar of a diameter equal to a No. 6 silver catheter, the usual size to use, is thrust through the cyst-wall, there is a great risk that, owing to the friability of the cyst-wall, the membrane may tear on either side of the trochar, and thus a leak may be made into the peritoneal cavity. The intracystic pressure has been estimated by Thomas in several instances by means of a pressure gauge, and he found that it amounted to an equivalent of eleven or twelve inches of water; and this, he is careful to observe, is the intracystic pressure only, not that exercised by the surrounding walls, such as the diaphragm above and abdominal walls in front, both of which would act as further expelling forces for the fluid.

Again, a living hydatid forms few or no adhesions; so as the fluid escapes the cyst contracts and collapses, and may slide away from the trochar altogether, or permit the fluid to leak away round the margin of the trochar, supposing there is no tear of the membrane.

When any of these contingencies takes place, and the active fluid is poured into the peritoneal cavity, apart from any

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immediate risks, there is the possibility of a diffusion of hydatids occurring over the whole peritoneum. That this does occur has been shown in our own post-mortem room at various times. Two such cases I have seen there.

Graham mentions several cases of multiple hydatids, as also do other authors on this subject.

The mother cyst may contain no daughter cysts, or may be filled with them; in the latter case, the insertion of a trochar is worse than useless.

When a hydatid has been dead some time or is suppurating, adhesions of quite a strong consistency do form with the surrounding tissues, a fact which is shown by the following case:—

A cabman, aged 43, was admitted to the Prince Alfred Hospital with a considerable swelling, occupying the right side of the epigastric region.

The tumour was diagnosed as hydatid, and the physician under whose care the patient was, after telling the patient to grip the sides of the bed, took a scalpel and plunged it into the tumour, making a large crucial incision of about two and a half inches in either direction. From one and a half to two pints of very foul semi-purulent fluid was let out, with a quantity of daughter cysts. The cavity was washed out with a weak solution of carbolic acid and iodine, and in due course the man quite recovered.

I must confess to watching this somewhat summary operation with feelings of trepidation, as no preliminary investigation had been made to see whether the hydatid was living or dead, and had it been living, most of the fluid would have emptied itself into the general peritoneal cavity; but the cyst-wall had formed quite firm adhesions, and was thus shut off. This is the rule in dead hydatids. In such cases a trochar may be used without much fear of risk, but also without any chance of a cure.

The only time when a trochar should be used is when there is some doubt as to the diagnosis, and then the very finest hypodermic syringe should be used with a sharp needle; the surgeon being prepared at the time to do a radical operation by incision.

The following cases of *thoracic hydatids*, both treated by tapping, and both ending fatally, further illustrate the grave risks of this method of treatment.

A man between 50 and 60 years of age came to the Prince Alfred Hospital, Sydney, complaining of great shortness of breath. He was examined by my friend and former colleague, Dr. E. J. Jenkins, and the case was diagnosed as one of hydatid of the lung.

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A fair-sized aspirating trochar was introduced in the mid-axillary region on a level with the nipple, this being at that time the usual method of treating such cases. A few ounces of clear fluid ran into the bottle, when the man gave a slight cough, which was at once followed by a great gush of clear hydatid fluid from the mouth. The man fell back in the bed, and in a very few minutes was dead. At the post-mortem examination nearly the whole of the right side of the chest was filled by the hydatid cyst, and the other lung had been drowned by the fluid running out by the sides of the trochar, and so up the right bronchus down the left into the lung.

The other case to which I wish to refer is one which has been fully recorded by Dr. Bristowe in vol. xxiv. of the Clinical Society's Transactions.

The patient was a boy nine years of age. The case was regarded as one of pleurisy with effusion, and a large aspirating needle was introduced. Very little fluid came through the canula, but clear frothy fluid began to pour out of the boy's mouth. His breathing became difficult, his lips blue, and his pulse feeble. He became restless, and was obviously in great distress.

In spite of every care "death ensued in about seven or eight minutes after the first puncture."

Dr. Bristowe further says:—"It is not difficult to understand the mechanism of this accident. The living hydatid accurately fills the cavity in the lung in which it lies, inasmuch as the cavity is due to the pressure the hydatid exerts, and the consequent gradual erosion or wearing away of the surrounding lung tissue; and further, the surface, unlike that of an abscess cavity, is (consequent on its mode of development) more or less sieve-like, or studded with orifices communicating with eroded bronchioles. "Hence, while during the healthy state of the hydatid no air can enter the cavity, as soon as the hydatid is punctured or ruptured, on the one hand, its escaping contents readily find their way into the air-tubes, and, on the other hand, air is admitted freely into the cavity."

This is, I think, a right explanation of what occurs in these cases, and I should like to emphasise the fact of the hydatid being living as a great additional danger, because, first, of its having no adhesions to surrounding structures, and, second, because of the delicate consistency of the cyst-wall, and the ease with which, on this account, it will rupture on either side of the canula.

Now, in a dead or suppurating hydatid the canula may be introduced without any fear of such fatal consequences occurring.

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The wall is much thicker, and the adhesions shut the cyst off from any chance of emptying itself into the lung, and the fluid is evacuated in the ordinary mechanical way. But even in these cases the results are entirely unsatisfactory.

The two following cases bear this out.

A girl, aged 14, was admitted with a hydatid tumour, which was supposed to have originally started in the liver and gone through the diaphragm into the pleural cavity.

This was aspirated with a large canula, and a quantity of very foul-smelling fluid escaped; the opening was then enlarged, and the cavity washed out with carbolic lotion and tincture of iodine, 3i. to oj., and a large drainage-tube was put into the wound. Quantities of hydatid fluid kept coming from the wound, and the cavity was daily washed out.

This state of things went on for over two months; the child's health began to fail, and it was thought that she would die.

The physician in charge of the case gave me permission to operate if I thought fit to do so. The same day I excised portions of two ribs, and found a large cavity in which were many putrid daughter cysts and a piece of drainage-tube. The cavity was thoroughly cleansed and perfect drainage established.

In six weeks the girl was out of the Hospital, and just previous to my departure from the Prince Alfred Hospital I received the photograph of the young lady, looking the picture of health, sitting in front of a grand piano.

The other case was that of a woman, aged 38, with a thoracic hydatid, which had been treated in an exactly similar manner to the previous one, viz., by aspirating and then enlarging and draining the wound, which was occasionally dilated with dressing forceps as it periodically closed up.

The woman went from bad to worse, and, refusing to have anything further done, eventually died about four or five months after admission.

In the *Australian Medical Journal* of 1888 Thomas gives various tables showing results obtained by tapping operations.

The general result was that of 411 cases so treated, there were seventy-three deaths, a total failure of tapping in 170 cases; giving a percentage of 17.761 deaths, and 41.362 of failures. And this, it must be remembered, is the most favourable side from which this treatment can be viewed, as there can be little or no doubt that if many of the reputed cures were followed out, the results would often be found quite untrustworthy.

The curing of a hydatid by a single tapping, when it occurs,

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is due to the fact that the hydatid cyst collapses, and falls away from its host, from whom, in its normal state of tension, the hydatid obtains nourishment by diosmosis.

Apart from this, there is no other way by which a hydatid can be cured by tapping.

Viewing, then, first, the grave risk of immediate death, which occurs in nearly 18 per cent.; secondly, the uncertainty of the measure; and, lastly, the unfortunate *sequelæ* which not unfrequently happen, it would seem that tapping a hydatid, with or without an aspirator, is a method of treatment which should rarely, if ever, be resorted to.

The only exception to this is in the case of a pulmonary hydatid, which has a layer of lung-tissue intervening between it and the thoracic walls. If, in such a case, after an incision has been made down to the lung, it should be thought necessary to relieve the tension of the cyst, a *fine* aspirator may be introduced and some of the fluid drawn off.

The second method of treatment with which this paper deals, viz., a free incision over the tumour, emptying, and, when possible, removal of the cyst, may be termed a radical operation.

The early stages of this treatment, when it was undertaken without any precautionary measures, were, as may be imagined, anything but satisfactory; and in cases of non-suppurating hydatids of the abdomen, rapid death from peritonitis was the result.

This danger being recognised, the next step was to procure adhesion between the tumour and the parietes before incising. To this end caustics were applied and needles were inserted, and various measures were taken to produce inflammatory adhesions.

*Simon's operation*, consisting of first procuring adhesions by means of a trochar being inserted and left in, and then waiting until the hydatid suppurated, and incising after a fortnight, may be considered the next step; but the objections to this method will be sufficiently obvious to most *fin de siècle* surgeons without going further into details concerning them.

After various phases of Simon's plan of operation, undertaken by Bigin, Volkmann, and others, it devolved upon Lindemann, of Hanover, to originate an operation by means of which the sac was incised, emptied, and removed at one operation, thus effecting a radical cure.

This operation was first done in 1871, on a patient with a tumour of the liver which was so tense and the abdominal wall covering it so thin, that it was feared spontaneous rupture would occur. An incision was made, and the opening of the sac was attached to the parietal incision by deep stitches. The



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patient recovered. This plan of operation was followed by various other German surgeons, and in 1881 Lawson Tait published an account of four cases in the *Birmingham Medical Review* for October, in which practically the same methods had been carried out.

The method of operation is as follows:—The skin is cleaned and prepared in the usual way for all operations. An incision is made over the most prominent portion of the tumour down to the peritoneum, and all hæmorrhage is stopped: the peritoneum is then incised to the full length of the wound, and the hydatid sac then shows in the wound around the hydatid. According to its position, there is an adventitious sac of fibrous tissue of greater or less thickness, the thickness dependent upon both the mode of growth of the hydatid, and upon the age of the parasite.

The cyst and its sac being fully exposed, the great object is to evacuate the fluid without any escaping into the peritoneal cavity; and that this may be effected, stout silk sutures may be passed in parallel with the wound, and the cyst drawn to the surface by means of these. Fluid is apt to escape from the sides of the suture, and the suture itself may tear through the sac and hydatid membrane. Under these circumstances, I think it a safer plan to use some broad serrated clamps, long in the handle, similar to those used in ovariotomy, without the spikes. Two pairs of these fixed, one on either side, will, with a moderate amount of force, bring the cyst up to the lips of the external wound. The cyst may now be incised, or a large trochar inserted, and all the fluid is removed.

The sac is now stitched to the skin, the muscle being also included, but not necessarily the peritoneum. The remaining fluid is removed, and any solid material. Great care must be exercised in the removal of the mother cyst, and the operator must remove all the cyst, either by broad forceps or by the nail, or by a blunt spoon, this latter being used with great caution. The cavity is washed out with some non-irritating antiseptic fluid by means of an irrigator; then the cavity is sponged dry after the fluid has been allowed to run out or has been drawn off by a syringe.

A drainage tube may be left in for forty-eight hours, but this is not necessary if the incision through the sac has been sufficiently free.

The wound is then covered by an ample pad of antiseptic dressing, and pressure is applied fairly firmly.

If the hydatid is not a suppurating one, the case should be well over in a month; but if it is suppurating, the time may be

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considerably prolonged. It is as well in these latter cases to use a drainage tube.

In the *Australian Medical Journal* for 1889 Thomas gives results of sixty-eight cases of liver hydatids treated by abdominal section, immediate removal of the mother cyst, and stitching of the sac to the parietal wound.

There were seven deaths and sixty-one recoveries, being nearly 90 per cent. of recoveries. Comparing these figures with those of the tapping operations, taking both the deaths and failures, the operation by direct incision seems to want no further advocacy to recommend it.

In cases of pulmonary hydatids the results of direct incision are not so good, but there can be no doubt that this is by far the best operation.

Hydatids of the brain are not very common, and do not usually attain any large size on account of the rapidly fatal issue that follows. The method of operation does not differ from that employed in other brain tumours.

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# NOTES FROM THE ELECTRICAL DEPARTMENT.

BY

H. LEWIS JONES, M.D.

As our Electrical Department is one of the most important in this country, a few notes of the work done in it during the past year may be of interest.

The work of an electrical department may be arranged in two divisions—(1.) The management of the apparatus; (2.) The treatment of the cases.

The maintenance of electrical apparatus in good order demands unceasing care to withstand the daily wear and tear. The treatment of each patient means the actual expenditure of chemical and electrical energy, and this cannot be supplied without cost. In the equipment of an electrical room there are very many points of detail which require attention if the work is to go on smoothly, and such small matters as the best form of conducting wires, the most convenient kind of electrodes, or the most suitable contact breaker for a coil, all become important in a busy department. Among the chief points which have been considered during the past year are the following:—

(1.) The best form of battery for medical purposes.

(2.) The best form of statical machine.

(3.) The details of construction of the induction coils.

(4.) Sundry modifications in form of electrodes for special purposes.

1. *Batteries.*—The renewal of batteries is one of the most costly items in electrical treatment, and until it becomes possible for us to take the current from the electric lighting mains, this will continue to be the case. During the year we have tried to substitute some other type of cell for the bichromate battery, and have now given up the use of that form of cell almost entirely, a reform which has very largely cut down the work of renewals and recharging of cells. The uncertainty of bichromate batteries, and their corrosive exciting fluid, which quickly

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destroys the battery connections and the battery boxes, make them unsatisfactory. In place of the bichromate cells we are now using accumulators when large currents are required, and Leclanché cells for small currents. Even when the current required is only of moderate magnitude, as, for example, .5 or .6 of an ampère (the current required for an incandescent lamp), the bichromate battery still proves but an untrustworthy affair, often failing to do its work during the ten or fifteen minutes during which a cystoscope is required to be lighted. Since we commenced to use an accumulator for the cystoscopes there have been no vexatious failures in battery power during the examination of the bladder, while both the prime cost and the cost of maintenance of the storage cells are lower than in the case of a large bichromate battery. There are now four accumulators in regular use in the Hospital, and all but one of them have worked satisfactorily, although the work they are called upon to do is heavy, and the conditions under which they are kept, namely, long periods of inaction and rechargings at rare intervals, are not those most conducive to their long life. To light the incandescent lamps used in the cystoscopes and other small surgical lamps an accumulator of four cells is needed, and the E. P. S. Company have made one for the Hospital at a moderate cost which answers the purpose admirably. Its weight (31 pounds) is very much the same as that of the six-cell bichromate battery which was formerly in use. If cauteries have to be heated, there is nothing which can do it so well and so easily as an accumulator.

For the general work of the department the Leclanché cell still holds its own as the best and least troublesome. In the cellars underneath the electrical room there are three batteries of large Leclanché cells, which still do their work admirably, although many of the cells are three or four years old. These three batteries, of sixty cells each, have this year been thoroughly recharged and rewired, and their zincs renewed or freshly amalgamated by the attendant in the Department, and they will probably continue to work for two or three years more.

Sixty cells in series is rather a large number for a medical battery; for thirty cells will supply a sufficiently high pressure for most purposes; and therefore we have been able to tap one of these batteries, and lead off thirty of its cells to a switch connected with the electric bath, to take the place of a not very satisfactory Stoehrer's battery, which was formerly used for the bath. The current of 250 milliampères which may be required for the electric bath is rather a large one for any Leclanché cell to yield for a length of time, but the falling off

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of current from polarisation during the ten minutes of the bath is only about twenty-five milliampères, and the switching in of two or three extra cells at the end of the first five minutes, makes up for the decrease, and still leaves in reserve several cells of the thirty which make up the battery.

The small-sized Leclanché cells used in the portable batteries are not so satisfactory, because the liquid has a great tendency to crystallise, with the formation of a double chloride of zinc and ammonia. This is very insoluble, and in time encrusts both the zinc and the carbon, and raises the internal resistance of the cells to such a degree, that they become useless long before their zincs are exhausted. We have now under trial some Leclanché cells which have been charged with a solution of pure zinc chloride (one in ten), and seem to promise favourably. As they contain no ammonium chloride, there can be no formation of crystals of the double chloride; and the oxide of zinc which is formed in them can be quickly got rid of by the introduction of a little hydrochloric acid at the time of recharging. If they are found to work well in practice, this modification, recommended by M. Gaiffe, of Paris, should effect a considerable saving in the cost of renewals in primary batteries.

The dry cells, which have come so much into notice during the last year or two, have also been tried in the Department. All of these are modified Leclanché cells packed with a paste of ammonium chloride and other ingredients and sealed up. When new they are good cells, but the small sizes quickly deteriorate, at least many of those in the market have been found to do so. However, one form of dry cell—Hellesen's—made by Siemens Brothers, is a good one, and has stood the test of a year's work very well.

Dry cells require more careful management than the ordinary Leclanché. They have a low internal resistance, and are quickly run down if left short circuited, and then cannot be recharged. This makes them rather unsuitable for a battery which is used by many different persons. In careful hands they are the most convenient cells of all, but as yet, among the small-sized cells used in portable batteries, the Leclanché continues to hold its own for durability. With these, as with the dry cells, it is much the most economical plan to use large cells whenever possible, and to keep the small sizes for use away from home, when portability is a more important consideration than anything else.

*Statical machines.*—There is only one statical machine which will meet the requirements of an electrical room, and that is the Wimshurst machine, for no other form can be trusted to

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work in damp weather and to maintain the polarity of its conductors without change. It is true that the Wimshurst machine can be reversed at will without much difficulty, but it does not reverse itself spontaneously during action, as the other forms of influence machine are prone to do. For medical treatment it is important to have a machine of large capacity, because when a patient insulated on a couch or chair is being charged from the machine, there is a very great amount of leakage from the points and angles of his clothes, from his hair, and from the edges of the couch. A machine with eight or twelve plates each of 18 inches in diameter will suffice; and it is best to have the machine enclosed in a case to protect it from dust, which is attracted to any electrically charged body.

Such a machine has just been constructed for the Department, and we are now for the first time able to apply "Franklinism," as it is called, to the patients in a proper manner. The new machine will replace one of Carré, which is not capable of supplying any but a small amount of electrification.

The positive and negative electrodes of an electrical machine can be distinguished by presenting a blunt point, for instance the finger, to the conductors of the machine in action. On the side which is positive the discharge takes the form of a bright star-like point at the tip of the finger, which remains unaltered until the finger is brought within a distance at which a spark can pass. On the negative side the first appearance is also a star-like point, but as the finger is brought nearer, the discharge takes the form of a brush between the finger and the conductor.

The same points and brushes can be seen at the collectors of the Wimshurst machine, and with a little experience one can tell by a glance at them which is the positive and which the negative side of the machine. The difference between the effects of the two poles is said to be important, the positive charge being good, but the negative quite the reverse. It is doubtful, however, whether any difference could be recognised by an average patient. It is to be hoped that in time some increased knowledge of the physiological and therapeutical effects of statical electrification may be arrived at. At present our knowledge is most meagre. Apart from its use in the treatment of hysterical symptoms, we have but little to say about it, but with the help of the new machine we hope to make some progress during the coming year. The statical treatment of chorea seems to have been so very satisfactory in the hands of Sir William Gull and Dr. Golding Bird at Guy's Hospital in the earlier part of this century, that it should not be allowed to fall into neglect without further trial, and perhaps

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some opportunities of trying the machine in chorea may be afforded us during next year.

*The induction coil.*—The proper construction of this instrument has been very much neglected since the time of Duchenne, whose views on the subject are still quite correct and sound, although they are expressed in language which is now perhaps a little out of date. Meanwhile the ingenuity of instrument-makers has run riot in contriving all sorts of needless complications, the climax being reached by certain American-made coils, which are warranted to give ten different sorts of current.

Coils are applied to two main uses in medicine. The one is to stimulate and set up contractions in muscle, and the other is to stimulate the cutaneous sensory nerves. For the former purpose a fairly large current is required, because only a part of the total current reaches the motor point of the muscle, the rest being scattered and wasted by diffusion in the surrounding tissues. When the skin is well moistened with warm water to bring down its resistance, the required current (5–10 milliampères) can be passed through the body by a pressure or electro-motive force of about ten volts, and this is a sufficient electro-motive force. When it is wished to stimulate the cutaneous nerve-endings, a much higher electro-motive force is needed to overcome the resistance of the dry skin, but the current must not be so great, because it reaches the nerve-endings before it is scattered by diffusion. It is a fortunate thing that increased electro-motive force is obtained in induction coils at the expense of current, for otherwise some of the coils in daily use would be dangerous machines, yielding as they do an electro-motive force of several hundred or thousand volts. However, the electro-motive force of a coil only becomes important in proportion as its maximum current is large, for it is the magnitude of the current as measured in milliampères which is the important factor in producing physiological effects. An induction coil can be wound with so large a number of turns in the secondary as to give a long spark, but a very small current, even one milliampère or less. Such a coil will produce very sharp and painful impressions when applied with a dry brush, but will be hardly felt at all through a wetted pad, and will produce no contraction of muscles when applied to the motor points. By using a coil which is tapped at several points of its length, one can obtain an instrument suitable for all purposes. The whole coil, then, gives a small current at a high electro-motive force, and this is best for cutaneous effects, while a portion of it can be used when a lower electro-motive force and a larger current is required for testing muscles.

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Another important point is the rate of vibration of the contact breaker, for this determines the frequency of the impulses or shocks of the coil. This point (*i.e.*, the best frequency) is not yet very fully worked out, but as a contribution to our knowledge it may be said that, other things being equal, a rate of 600 to 800 vibrations per minute approaches closely to the normal rate of contraction of muscles in ordinary voluntary movement, and is very suitable frequency for testing muscles. If the contact breaker move much more slowly than this, there is more commotion of the muscle, as it has time to relax between the shocks, and this is attended by greater discomfort, which may or may not be desirable. With the very rapid frequency of 12,000 per minute of the alternating current electric light circuits, a very marked anæsthetic effect is felt in the area supplied by the sensory nerves reached by the current, and there is a burning sensation in the part of the skin which is in contact with the electrode, however carefully it may be applied to the surface. This makes the current from the electric light mains somewhat unsuitable for muscle testing, even when its voltage has been modified by a transformer; a circumstance which is to be regretted, because those currents can be measured accurately by a proper galvanometer, while the measurements of an induction coil current are at best not very satisfactory.[1]

*Switches.*—Among the smaller points which have been considered during the year, there is one worth noting. This is an improvement in the switches used for throwing the battery cells into and out of circuit. By means of a resistance coil ingeniously arranged in the switch itself, this can now be made to pass from stud to stud of the switch-board without short circuiting the cells, and without any breaks of contact. As the current wasted through short circuiting with the old form of switch was probably as large as the whole current used for the patient, this improvement adds greatly to the life of the cells.

Four new galvanometers have been supplied during the year, and wires have been fixed up in the room, so that any of the stationary galvanometers can be quickly put in circuit with the standard galvanometer, if it is wished to check and correct their readings. Eight separate batteries are in regular daily use in the Department, besides the galvanic and faradic apparatus belonging to the electric bath-room.

[1] The measurement of induction coil currents by a galvanometer is not satisfactory, because the mean current, which is what the instrument indicates, is no clue to the maxima, on which the effects depend.

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The cystoscopes have been used in the wards thirty or forty times during the year, and the galvano-cautery is used almost every week in some department of the Hospital. We have also been frequently called on to illuminate operation wounds with small incandescent lamps, and, so far as that can be managed with the little lamps and the batteries at our disposal, with success.

It is to be hoped that before long the Hospital may have the advantage of an electric supply from the public mains, for then incandescent lamps of adequate size will be available for operations, and galvano-cautery apparatus can be easily fitted up so as to be always ready for immediate use.

A new faradic apparatus has lately been supplied to the operating theatre, with electrodes and connections contrived so as to be always ready for immediate use in cases of emergency.

The cases under treatment in the Electrical Department may be classified in the following way, according to their relative numbers:—

| | | | |
|---|---|---|---|
| Nævus . . . . | 56 | Muscular atrophies . . | 14 |
| Infantile paralysis . . | 54 | Facial palsy . . . | 12 |
| Injury of nerves . . | 41 | Neuritis . . . . | 11 |
| Enuresis nocturna . . | 24 | Writer's cramp . . | 4 |
| Hemiplegia . . . | 17 | Lead palsy . . . | 3 |
| Sciatica and lumbago . | 17 | | |

The total number of new cases seen in twelve months was 380, and several points of interest which have arisen may now be dealt with briefly.

*Nævus.*—The number of cases of nævus sent for electrolysis is very large, and as most of them have required treatment under an anæsthetic twice, or more often still, the number treated represents a very considerable amount of work. Some of the larger nævi have been electrolysed five or six times before being completely cured, for there is a great difference in the behaviour of nævi under treatment. Sometimes the tendency to grow and spread is very marked, and in these the smallest speck of nævoid tissue which has escaped complete destruction will grow afresh in a most persistent manner. This is especially the case in very young children. In older patients the activity of the nævus is usually very much less, and the destruction of part of it may be followed by shrinking and disappearance of the whole. When the nævi are cutaneous, and the skin itself is a mass of capillaries, it is absolutely necessary to destroy the skin to obtain a cure, and in these cases a scar is certainly formed. The electrolytic treatment of such nævi has not any special advantage over the older methods of destruction

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by caustics, except that the process is rather more under control than the action of caustic usually is. For the treatment of subcutaneous nævi electrolysis is by far the best method, because the skin can be preserved intact, except for the small scars at the point of entry of the needles. Care must be taken that the electrolysis of such cases be not carried on too energetically, for if sloughing of the nævus be induced, the skin over it is very likely to perish. As the destructive action depends upon the density of the current rather than upon its magnitude, the current used must be determined by the number and length of the needles inserted into the nævus. A density of 30 milliampères per inch of positive needle is quite sufficient, and even then the positions of the needles should be changed once or twice during the period of ten minutes usually allowed for the treatment. The fork electrode described in the *British Medical Journal*,[1] which carries any number of needles up to five, and has the alternate needles positive and negative, is a very good instrument, because by its use the needles are maintained parallel to and equidistant from one another, and this keeps the current density uniform throughout their length; and the destruction of the tissue also goes on uniformly.

When a subcutaneous nævus has been successfully treated, it commonly happens that a hard mass of fibrous tissue remains in its place. This may seem as though the nævus had not been completely cured; but the electrolysis should not be repeated unless it is certain that there is still nævoid tissue remaining undestroyed. The knot of fibrous tissue will disappear in the course of a few weeks or months if left alone.

In one or two cases it has seemed as though the nævus had made its first appearance after the birth of the child. At least the mothers have asserted that there was no sign of nævus for the first week or two after birth. It is an interesting point whether nævi may or may not originate after the birth of a child.

One of our cases was admitted to the Hospital and died of pneumonia eight or nine days after the electrolysis. This was the only casualty.

*Infantile paralysis.*—We have had very encouraging results in the treatment of infantile paralysis, even when the cases have come to the Department after several years of neglect. It commonly happens that two or three years elapse before the parents begin to bestir themselves in these cases; then, as the child reaches an age when it should be able to run about and

[1] Brit. Med. Jour., February 1892, Dr. Lewis Jones, "An improved instrument for the electrolysis of nævi (with figure)."

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amuse itself, its crippled state becomes more apparent, and advice is sought. The chief requirement for these little patients is that they should attend regularly and for a long time. It almost always happens that at the end of three months' treatment there is a very marked improvement; so much so, that the mothers are most willing to persevere in their attendance, and many of the children are brought twice a week regularly for six months, nine months, or a year. It is very gratifying to see the growth of the paralysed limbs under treatment. Many patients have been able to discontinue attending during the past twelve months with satisfactory, not to say sturdy limbs, who came in the first instance with atrophy, paralysis, and a reaction of degeneration in one or more muscles.

There are at present attending the Department no less than twenty of these children; in all but two or three, the paralysis is of one or both lower limbs, and every one of them is improving more or less.

During last summer a child who was under treatment for infantile paralysis in one leg, was attacked afresh in the other at a time when the first leg was almost recovered. Fortunately the second attack was not severe, and the patient is now quite recovered on both sides.

The cases which begin to improve under electrical treatment, even after one or more years of paralysis, confirm the opinion of Duchenne, that it is unwise to trust solely to the lapse of time to restore power to a paralysed muscle, for although some paralyses may recover spontaneously without treatment, others will remain quite stationary for several years, and yet commence at once to improve under electricity.

The routine method of treatment at the Hospital is to use the negative pole with the continuous current, and to move the electrode slowly up and down over the whole of the affected parts for ten minutes, while the indifferent electrode is placed over the dorsal spine.

The mothers are also instructed to bathe and rub the children's limbs with hot salt water at night, and this no doubt helps considerably in the favourable results which we have obtained.

The magnitude of current to be used depends upon the tenderness of the patient's skin. If the child is made to cry by the touch of the electrode, the current must be diminished until toleration is produced. Three or four milliampères is as much as can be borne by many children, though sometimes they seem indifferent to twice that current. By increasing the area

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of the electrode larger currents can be used, a suitable size for the electrode being 1½ to 2 inches in diameter.

*Injury of nerves.*—Most of these were cases of pressure paralysis, commonly occurring in patients who had been sleeping heavily after alcohol, or in patients using crutches. In both these groups of cases the musculo-spiral nerve is usually affected, but we have had one case of sleep-palsy affecting the deltoid only. Another important group is that of injury to the deltoid from blows on the shoulder. In paralysis of the deltoid it is not at all unusual for the anterior part of the muscle to give electrical reactions differing from those of the posterior part, and this has been ascribed to a subsidiary nerve supply of the front part of the muscle from branches of the anterior thoracic nerves. This apparent double nerve supply has been clearly evident in several patients who have come under observation; but the accessory nerve supply has not been of service to any of four patients attending with infantile paralysis of the deltoid: that is to say, we have not seen the anterior portion of the muscle normal while the posterior part was atrophied and degenerated from that disease.

*Tinnitus aurium.*—Out of the forty-one cases treated there have been a fair number, one-third or one-half, completely relieved, but the results are not so uniformly satisfactory as one would like to see, and this is natural when one remembers how many different causes there may be of tinnitus. Some of our patients return from time to time for a renewal of treatment when from some cause their tinnitus has reappeared, and they are quickly freed from the noises after a few more sittings.

The treatment of tinnitus is much simplified by the use of the double or binaural electrode introduced at the beginning of the year. This has many advantages over the mode of treatment formerly in vogue, which required the patient's ear to be filled with water, and was only applicable to one side at a time. The binaural electrode made by Arnold & Sons enables one to apply equal and simultaneous treatment to both sides; and this is a very important matter in tinnitus affecting both sides.[1]

Electrical treatment is a very simple method of treating noises in the ears, and should always be tried when patients suffer from persistent tinnitus. It is necessary, however, that the operator should know the positive pole of his battery from the negative, and there must be a galvanometer in the circuit, and a rheostat for varying the current in an even and gradual

[1] For figure and mode of applying this electrode, see Steavenson & Jones' "Medical Electricity," p. 256.

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manner. This is very important in every case when galvanic currents are passed through the head, where sudden makes or breaks of current are extremely unpleasant.

*Enuresis nocturna.*—These cases have done very well under electricity. It is necessary to continue the treatment regularly for some little time after apparent cure, in order to withstand the tendency of the bad habit to return, otherwise the patients are very likely to relapse. There is a good deal of difference between patients in the way they respond to the treatment; some are decidedly better after two sittings, and others improve only very gradually. Sittings should be continued twice a week for eight weeks as a rule. The positive pole is to be placed on the perineum, and the negative on the lower dorsal spine. We have found the patients to do best with five minutes of faradic treatment and five of galvanic, but it is common for patients to do well with either the continuous or the interrupted current. In one case only of enuresis nocturna did the treatment fail; most of the other patients had previously undergone courses of treatment by drugs without good results.

The cases of *sciatica* have been satisfactory; they have been treated partly by the application of the positive pole to the sciatic region, and partly by the electric bath. One patient, who was not improving under local treatment, at once lost his pain after a few baths. On the other hand, some have been cured by the local treatment after the bath had failed to produce any effect.

Among the patients treated for sciatica and lumbago there have been three or four students of the Hospital, who have been improved or cured by a course of electric baths.

The *hemiplegic* cases are not very promising so far as chances of recovery go. And ancient cases have been referred to the Department, who might just as well have been spared the pains of coming, so evidently and hopelessly incurable were they. The chief advantage likely to accrue in hemiplegias is that faradisation of the paralysed limbs will often bring back some voluntary power in them. This good effect follows quickly after two or three sittings, as though it acted by restoring to the will some control over muscles whose motor fibres had not been actually destroyed. It is not reasonable to expect electrical treatment to restore a spinal cord which is the seat of advanced secondary degenerations in cases of old hemiplegia.

We have had very few cases of neuralgia to treat; but from results which I have seen elsewhere, it appears to be a very favourable condition for the application of electricity. Nor have we had an opportunity of investigating the effects

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of electricity in promoting the secretion of milk, nor in constipation, nor in joint-affections, nor in ascites. For all of these conditions electrical treatment has been tried and recommended by Erb and other writers.

The removal of hairs by electrolysis with a fine needle has given us a very good result in a patient with trichiasis. He has had every hair removed from his upper eyelids, and his cornese are now quite clear and bright, although before he came under treatment he had marked vascularity and pannus in both eyes. Another uncommon case which was under treatment was one of extroversion of the bladder, in whom we were asked to perform epilation of the pubes in order to secure a hairless surface from which to make the flaps for a plastic operation. After a large number of hairs had been removed, the patient was unfortunately discharged for unruly conduct, and the case therefore came to nothing.

The electrolysis of stricture of the urethra and of fibro-myoma of the uterus have been almost wholly given up in the practice of the Hospital, nor has there been any case of electrical treatment of aneurysm. The number of electric baths given during the year is very considerable; although no exact record has been made, it must be between two and three hundred.

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# THE CONDITIONS OF THE PULMONARY CIRCULATION.

BY

J. F. BULLAR, M.B.

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The following short paper regarding the pulmonary circulation was written by me in the autumn of the year 1884, and the quotation from Professor Michael Foster's work on Physiology was taken from the then last edition of the book.

Just before Christmas 1884, while working at this subject, I was invited by Dr. Andrew to act as his House-Physician during the unavoidable absence of Dr. Davies, and my work on the circulation in the chest came to an end and was forgotten.

While lately reading Dr. Andrew's Harveian Oration for 1890, I was reminded of this paper, and as I find that the passage referred to in Foster's Physiology occurs in the last edition, p. 618, § 383, it seems that possibly the interest of this little paper may be sufficient to absolve me, even in the eyes of Dr. Andrew, from actual criminality in adding to the mass of medical literature. It is possible that the vast magnitude of medical literature is an advantage for which we should all be thankful, for it furnishes an unanswerable excuse for leaving it unread.

A consideration of the arrangement of the valves of the heart and of the division of the blood-vessels into extra-thoracic and intra-thoracic portions leads to conclusions which appear to have been overlooked.

In the first place, the arrangement of the cardiac valves is such that during the ventricular systole the blood between the tricuspid and mitral valves, and during the ventricular diastole the blood between the pulmonary and aortic valves, is entirely shut off from the rest of the circulation. Therefore, as shown in the diagram, the blood in the pulmonary vessels and left auricle is always shut off from the systemic circulation; the



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blood in the right auricle is never shut off; the blood in the ventricles is alternately turned off and on, the left ventricle communicating with the systemic vessels during the systole, and the right ventricle during the diastole of the ventricles.

In the second place, the whole system thus shut off is placed

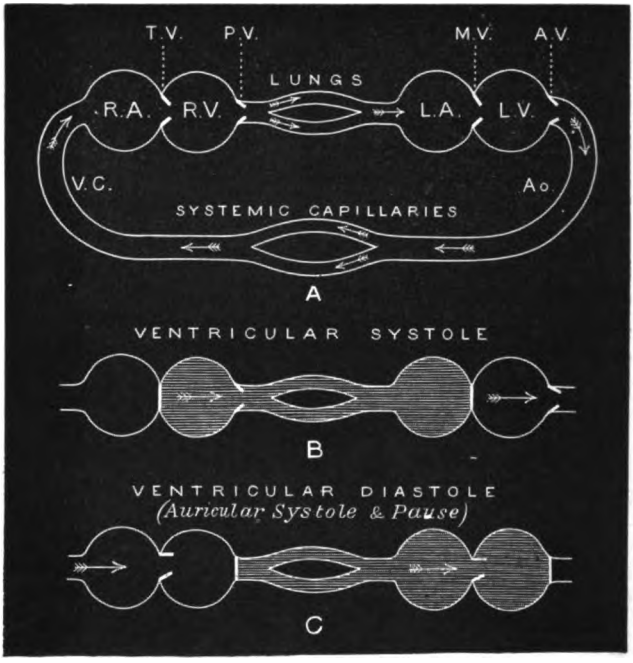


FIG. A. represents the heart and the systemic and pulmonary circuits. For the sake of simplicity the right and left sides of the heart are separated. The direction of the blood current is represented by arrows, and all the valves are shown in the open state.

FIG. B. represents the condition of the valves during the ventricular systole. The portion of the system cut off from the systemic circuit is shaded.

FIG. C. represents the condition of the valves during the ventricular diastole. The portion of the system cut off from the systemic circuit is shaded.

In FIGS. B. and C. the systemic circuit is omitted, as also the reference letters—a glance at Fig. A. will serve to identify the various parts.

| | |
|---|---|
| R.A. Right auricle. | T.V. Tricuspid valve. |
| R.V. Right ventricle. | P.V. Pulmonary valves. |
| L.A. Left auricle. | M.V. Mitral valve. |
| L.V. Left ventricle. | A.V. Aortic valves. |
| Ao. Aorta. | V.C. Vena cava. |

*within the thorax*, and therefore variations in thoracic pressure affect it as a whole.

These two points are of fundamental importance in the mechanism of the pulmonary circulation, and as their significance is not at first sight obvious, it will be well to consider what

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conclusions are to be drawn from them, and how we must accordingly modify our view of the subject.

Speaking of the pulmonary vessels, Dr. Foster says: "These, like the vena cava and aorta, tend to expand under the influence of the inspiratory expansion of the chest, and thus to become fuller of blood, very much as they would if the whole lung were placed under a large cupping-glass." Now, the action of a cupping-glass depends upon the fact that it shields a limited portion of the body, and therefore of the blood in that portion, from the pressure of the atmosphere. The weight of the atmosphere presses the glass against the skin, and at the same time tends to press the body into the glass. The blood, being the most easily moveable part of the body, and the vessels, particularly the veins, being distensible, the former is forced by the general atmospheric pressure into the parts beneath the cup, and by its pressure stretches the skin and adds greatly to the size of the lump formed by the less locomotive solid tissues.

The action of the instrument depends entirely upon its being applied to a portion only of the body. If the whole body were placed in a vacuum, there would be no "cupping" effect upon the blood-vessels, only the gases of the body would expand. The movements of the blood produced by cupping are solely due to the difference in the pressure on it at different parts.

The thorax, during inspiration, particularly during obstructed inspiration, acts as a cupping-glass to the systemic vessels, and, as Dr. Foster says, tends to expand the vena cava and aorta. But why do these vessels expand? Because the blood outside the chest is exposed to greater atmospheric pressure, and so is driven into them until equilibrium is established.

Now, supposing the glottis to be closed, what will be the effect of a strong inspiratory effort? As we have seen, the diminished intra-thoracic pressure will allow more blood to be driven by the extra-thoracic pressure into the aorta, vena cava, and right side of the heart. The distension of the aorta will be slight, owing to the elastic resistance of its walls, and during the ventricular diastole of the aortic valves counterbalancing the pressure of the blood. During the ventricular systole the pressure will be counteracted by the aortic walls, the contracting left ventricle, and the mitral valves. Thus, the blood in the pulmonary veins is shielded during ventricular diastole by the aortic, and during ventricular systole by the mitral valves, from the relative excess of atmospheric pressure acting upon the blood in the systemic vessels.

In the same way the blood in the pulmonary artery is shielded alternately by the pulmonary and tricuspid valves. It follows

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from this that alterations in intra-thoracic pressure can have no effect upon the distribution or upon the rate of flow of the blood in the pulmonary vessels.

From the arrangement of the valves, as shown in the diagram, it may be seen that a diminution of intra-thoracic pressure could not cup the lungs unless it were carried so far that the difference between external and internal pressure became greater than the blood-pressure in the pulmonary artery—sufficient, in fact, to force open during diastole the pulmonary, or during systole the tricuspid valves. Similarly an increase of intra-thoracic pressure, in order to drive blood out of the lungs, would have to force either the aortic or mitral valves.

Whether an inspiratory effort may ever be powerful enough to overcome the pulmonary blood-pressure may be doubtful; it must in any case be very unusual. An expiratory effort is probably never of sufficient force to overcome the aortic pressure.

The whole pulmonary system being thus shielded from external pressure, is in the position of a man suddenly placed in a partial vacuum or taken up in a balloon; the change of pressure will have no "cupping" effect upon the distribution of its blood.

If the above reasoning be correct, the effects of changes in intra-thoracic pressure upon the movements of the blood are more simple than has been supposed, and are limited to the systemic vessels; for the right side of the heart and the left ventricle may be regarded respectively as prolongations of the vena cava and aorta. The effects on the pulmonary circulation will be *nil*, except in so far as more or less blood may pass through it from the vena cava, and further excepting the perhaps possible case of the forcing of the pulmonary or tricuspid valves.

The flow of blood through the systemic vessels is due to the differences of pressure existing in the aorta and right auricle. Changes in the intra-thoracic pressure affect the aortic and right auricular pressures equally, either increasing or diminishing them by an equal amount, and leave the difference between them the same.

The effect of a change in intra-thoracic pressure is to alter the *distribution* of the systemic blood; not to change the rate of the circulation.

Let us take the case of diminished intra-thoracic pressure; here the effect upon the distribution and rate of the blood in the pulmonary system—that is, in the part of it which may

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be at the time shut off—is, as we have seen, *nil*, since it affects all parts of the system equally. But the diminution of pressure upsets the equilibrium of the systemic circulation. The external pressure, being no longer counterbalanced by the internal, drives blood from the whole of the extra-thoracic vessels into the intra-thoracic vessels—in other words, diminishes the cross section of the vessels external to the thorax, and increases the cross section of those within it. The veins, being less rigid than the arteries, are affected most, and the intra-thoracic veins and the right auricle will continue to expand until equilibrium is established. Accompanying the distension of the vena cava and right heart there will be a similar, though less marked, distension of the intra-thoracic aorta and left ventricle.

While this redistribution of the systemic blood is taking place, there is no consequent change in blood-pressure, for although during the distension of the intra-thoracic aorta, there must be a diminution in the output of blood from it, this distension is exactly compensated by the compression of the extra-thoracic arteries. Distension of the aorta alone would lower blood-pressure; compression of the peripheral arteries alone would raise blood-pressure; when, as in this case, compression of the peripheral arteries distends the aorta, the two effects are exactly compensatory, and the blood-pressure is unaffected.

The same reasoning holds good with regard to the systemic veins and the right side of the heart; the distension of the one is the measure of the compression of the other; the blood-pressure in the venous system remains unchanged.

It appears at first sight that the distension of the right heart must be the effect of a greater rapidity of the circulation; but it is not so; it is simply the effect of a redistribution of the venous blood. When once the distension is produced and equilibrium established, the blood in the veins ceases to flow more rapidly than before. Although the blood appears to pass more rapidly through the veins, the same amount continues to pass through the same cross section in the same time. As the current in the extra-thoracic veins increases in rapidity owing to narrowing of "bed," so the current diminishes in the intra-thoracic veins owing to widening of "bed," and the extra blood which, during the establishment of equilibrium, flows into the right heart, never gets beyond it; for if the right auricle continues to contract with the same force as before, it will fail to empty itself, and the circulation through the lungs will be unaffected. The distension of the veins and right heart is a purely statical arrangement, and it is an error to suppose

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that more blood is brought to the lungs thereby, since, as we have seen, the lungs are shielded from all effects of cupping by the cardiac valves.

Of course, by an increase of thoracic pressure the reverse effects will be produced. As before, blood-pressure will be unaltered, and consequently the rate of the circulation will not alter; the diminished cross section of the intra-thoracic vena cava and right heart will cause the blood in them to flow faster, and the same amount of blood will reach the lungs.

The above considerations show that intra-thoracic pressure, except at the moment of its increase or diminution, produces only statical effects, and that the movements of the blood due to changes in thoracic pressure are purely distributive, and are confined to the systemic vessels, the blood in the pulmonary vessels being quite unaffected by changes in thoracic pressure. Alternate increase and diminution of thoracic pressure brings about a to-and-fro movement of the blood between the portions of the systemic vessels without, and those within the thorax —a movement which is greatest in the venous system, and from the effects of which the delicate structures of the lungs are entirely sheltered.

It is perhaps hardly necessary to add that the variations in blood-pressure having the same rhythm as the respirations have not been overlooked. The varying distribution of the blood in the systemic vessels and right heart no doubt affects the heart's contraction, and so indirectly the blood-pressure. What I have endeavoured to show is that variations of intra-thoracic pressure do not *directly* affect the pulmonary circulation.

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# TWO CASES OF GENERAL SPASTIC RIGIDITY.

BY

SIR DYCE DUCKWORTH, M.D., LL.D.,

AND

H. H. TOOTH, M.D.

## SIR DYCE DUCKWORTH'S CASE.

*Extreme spastic paralysis affecting all the muscles of the body—Right-sided paresis—History of a fall on the head—Pyrexia for about three weeks—Simulation of tubercular meningitis—Dysphagia, dysphasia, sweating—Temporary impairment of consciousness—Loss of control of sphincters—Absence of bed-sores—Emotional condition—Whining voice—Inspiratory noisy laugh—Progressive and extreme emaciation in respect of muscles and fat—Gradual improvement in the course of eight months.*

For the following abridged notes I am greatly indebted to my late House-Physician, Dr. Arkwright, who followed all the features of the case with much care and assiduity.

A. E. K., a sewing-machine pupil, aged 13 years, was admitted under my care into Elizabeth Ward in St. Bartholomew's Hospital on May 16, 1892, suffering from loss of speech and weakness of the right side of her body, with contraction of all the limbs, especially of those of the right side, much resembling hysterical contraction. She had lived in London with her parents, who were poor. At the age of eight years she was taken to the country by a well-to-do uncle, and lived in comfort and was well educated till three months before her illness, when she rejoined her parents, and was apprenticed as a seamstress.

The antecedent history of the case was that the girl had gone to a "demonstration" meeting in Hyde Park on May 1. She appeared to have caught cold, and was ailing for a week afterwards, when she recovered. On the 9th or 10th May she fell

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down some steps, hurt her back and her head, and vomited afterwards. She refused food and had headache. On the 11th she vomited several times, still had headache, and was "strange" in her manner. Appetite was lost, and "tremblings and burning heat" were noticed, with loss of sleep. The bowels were confined, and at night on the 12th of May she talked nonsense, "wandered and shook." She took to bed on the 15th, and had the bowels relieved by jalap. On this day she was found unable to speak, but made signs as if intelligent. The right arm and leg appeared weak, and these limbs were drawn up and twitched. There was also twitching in the face. No convulsions occurred. Swallowing unaffected. Occasional unconsciousness for a few minutes was noticed. No squinting.

The past history showed that she had been a bright healthy child, having had ordinary child's complaints. Menstruation has not appeared. Influenza two years previously. No history of fits, rheumatism, or otorrhœa. The father's brother and his great-aunt were insane. Five brothers and sisters were alive and well. The parents were healthy. The maternal grandmother was subject to fits.

After admission the patient lay quiet. Face flushed. The pulse was 104, of fair volume, slightly irregular and feeble. Respiration 36, regular. *Tache cérébrale* well-marked. She nodded and shook her head intelligently in reply to questions. The tongue was protruded straightly, thinly furred. Gums natural. Teeth good. Swallowing natural. The pupils were equal, acted fairly; ocular movements natural; no squint. Discs natural in both eyes. Ears natural; no tenderness, and membranes intact. No enlarged glands in the neck, but some slight rigidity detected, especially in passive turning of the head to the right side.

The heart was found healthy in all respects. The lungs were resonant, save at the left apex posteriorly, where there was some impairment, and a few doubtful râles were heard. Nothing abnormal in the abdomen save a distended bladder.

*Upper limbs.—Left arm* supple and natural; occasional twitching. *Right arm* moved stiffly and was tremulous. Grasp stronger than with left. Twitchings occasionally. Able to execute any movement with it when bidden. Fingers and thumb tend to be drawn together. Occasionally all the joints flexed and kept rigid for a short time; fingers subsequently extended. Sensation equal in both arms and natural, certainly to pain. Elbow and wrist-jerks not obtained.

*Lower limbs.—Left* occasionally assumed equino-varus position, especially when the right sole was tickled. Knee-jerk

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natural. No ankle-clonus. Plantar reflex natural. *Right*, some rigidity, occasionally drawn up by flexion of hip and knee. Foot also flexed very strongly and inverted (equino-varus), toes flexed. Knee-jerk much exaggerated. No ankle-clonus. Urine passed involuntarily in the evening. Temperature 101°.

May 17.—Face flushed. Profuse sweating. Neck rigid. Head rather retracted. Consciousness much impaired. Protrudes tongue when told to do so. Takes food well. No vomiting. Bowels confined. Urine passed into the bed. Eyes generally turned to right. Occasional squint, external and internal. Pupils rather small. No facial palsy detected. Abdomen rather retracted. Some urine was obtained, acid, 1020, with a cloud of albumen in it, and no sugar. This evening there was noted considerable persistent rigidity in the right limbs, and some degree of it in the left ones. Three leeches were put on over each mastoid process. The patient was placed on a water-bed. Milk diet and minced chop was ordered, and a mixture with bromide and iodide of potassium given four times a day, the bowels being cleared previously by two grains of calomel. Subsequently a drachm of syrup of the compound phosphates was ordered thrice a day.

May 18.—After leeching there appeared rather less rigidity in the limbs. Much sweating. Conjugate deviation of eyes to right; right pupil larger than left.

May 19.—Dysphagia. Inability to protrude tongue. Mouth and eyelids opened and closed as directed. Pupils reacted.

May 20.—Rather less conscious. Lay quietly with eyelids closed. Eyelids did not act together. Left disc clear. Right disc rather hazy, veins larger than in left, some doubtful swelling of disc. Less rigidity of limbs. Abdomen flat. No vomiting. No dulness in front of chest, some crepitations at right apex. Half a drachm of liq. hydrarg. perchlor. was added to the iodide mixture.

May 22.—Pulse occasionally irregular. Abdomen retracted. Respirations varied in rhythm and extent. Power of swallowing returned, but takes food slowly. Hardly any sign of consciousness. Neck no longer rigid.

May 23.—Lungs free. Return of rigidity in neck.

May 26.—Condition same. Perhaps less unconscious. Profuse sweating of face. Wasting. *Tache cérebrale* well-marked.

May 29.—Pulse regular, 132. No change in retinæ. Fed entirely by tube. Temperature for first fourteen days has averaged 102°, occasionally reaching 103°, 103.8°, and fell about fifteenth day of illness to 101°, and thereafter to an average of 99°, being seldom febrile subsequently. The dose of perchloride

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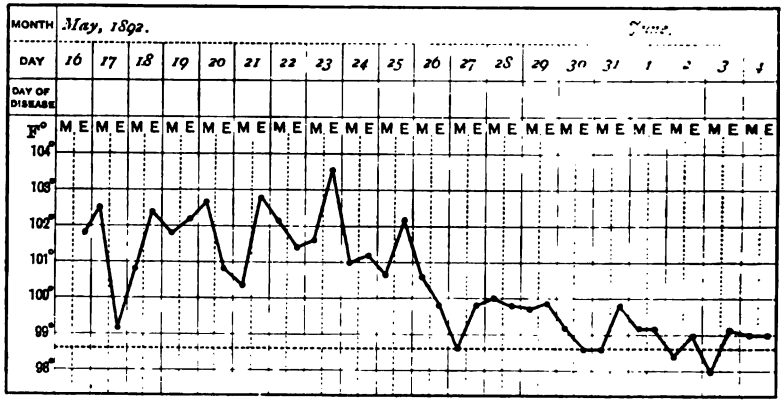
of mercury was doubled on the 23rd May. A circular air-cushion was placed under the hips, as some threatening of bed-sore had appeared.


MONTH
May, 1892.
June.
DAY
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4
DAY OF DISEASE
F°
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
104°
103°
102°
101°
100°
99°
98°

May 30.—Fed entirely by nasal tube. Head much more retracted. The face and limbs became very livid for about ten minutes to-day. Abdomen much retracted. Some impaired resonance noticed at left apex with crepitations, but a good air-entry generally in left lung. Conjugate deviation of eyes to right, with some nystagmus. Pulse 140; respiration 38.

June 1.—Optic discs found natural. Two eggs and two ounces of brandy added to the fluid diet. Occasional purgative doses of calomel were given. Head more retracted. Nystagmus almost constant, jerkings to the right side. Pupils equal. Pulse 160, occasionally intermittent. Rather more tremor of limbs.

June 6.—Medicine altered to gr. xv. pot. iodidi t. d.

June 11.—Optic discs again carefully examined and appearances found quite normal. Limbs very rigid and drawn up.

June 17.—Attacks of twitching in right limbs. Groaning when touched. Never opens eyes when told to do so now.

June 20.—Is extremely emaciated in trunk and limbs. Slight paresis of right side of face. Jaws clenched, but some slight power of opening remains. Head much retracted. Extreme contraction of limbs, require much force to extend them even a little. Although there is much difficulty in inducing her to open her mouth, she has been observed to yawn widely during the last two weeks.

June 21.—Exacerbation of general spasm, with tremors so

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large as almost to constitute clonic spasms, most marked in right limbs. Slight facial irritability on right side. Whines when limbs are extended. Iodide increased to ℈i. ter die.

June 23.—Made an effort to speak, and asked her mother to "stop."

June 25.—Spoke more distinctly, and asked for her father. Swallowed a teaspoonful of milk with some difficulty. Emaciation progressing.

June 27.—Swallowing better. Still sweats very much. Can open mouth and protrude tongue very slightly. Iodide is increased to gr. xxv. t. d., and brandy increased to ℥iii. Ceased to talk.

June 30.—Spoke several times to-day; asked to be turned over, and desired bread and butter.

July 8.—Restless at night of late; temperature raised for the last few days, reaching 103.2° to-day. No new physical signs. A few crepitations audible at base of left lung. Has spoken very little lately. Often groans. Emaciation progressing, and rigidity of limbs no less.

July 25.—Condition practically unchanged.

August 7.—Temperature rose early this morning to 102.8°. Vomited bilious matter early during the day.

August 11.—Generally better; more intelligent. Utterance only with great effort. Shuts her eyelids for "yes."

August 31.—Improving in various respects. Reads occasionally, and is more intelligent. Articulation very defective. Memory returning. Described falling down kitchen steps on to her head. At the end of a long sentence words die away from inability to control tongue and lips.

Sept.—Still losing weight. No material change. Memory improving.

October 3.—Gaining weight slowly. Movements improving. Articulation more distinct. Intelligence brightening. Inunction with cod-liver oil and daily shampooing of the limbs practised for last month. Taking maltine and compound syrup of the phosphates. No signs of any visceral disturbance. Is regaining control of the sphincters.

October 31.—The muscles having appreciably grown, were examined by Dr. Lewis Jones as to their electrical reactions. He reports that they are natural both in the much wasted extensors and in the better nourished flexors. She can now extend the arms and legs, and is in much better condition generally. The spastic contractions persist in all the limbs. The mouth can be opened half an inch wide, and the tongue protruded for half an inch. Is bright and cheerful, but very emotional.

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Temperature normal. Her weight has gone up from three stones nine pounds on August 13, to four stones three pounds on October 23.

Her laugh is very peculiar. It is always inspiratory, and accompanied by a harsh drawling noise. No delusions occurred at any time.

December 1.—Continues to improve in most respects. Can now open her mouth widely, and protrude the tongue better. Two days ago she was put under chloroform, and the limb was extended as far as possible. The joints appeared to be free, but the tendons of the hamstring muscles and those flexing the ankles were extremely tight and unyielding, especially those of the sartorius in both limbs. She is gaining both in muscle and fat. Shampooing with cod-liver oil is daily practised, and extension of the legs carried out for some hours each day by weights varying from 3 to 8 lbs. The hands are also extended on splints as far as possible. There is complete control of the sphincters.

December 6.—Mr. Bowlby examined the larynx. He found that efforts to withdraw the tongue met with resistance and caused rigidity of the organ. The pharynx was very sensitive. The general appearance of the larynx, only secured by applying cocaine, was normal. The chords moved well both during phonation and respiration. There was occasional incomplete abduction during inspiration. Mr. Bowlby considered the alteration in the voice to be due to the impaired movements of the tongue. Weight, 4 stones 3½ lbs., a gain of 1½ lbs. in the last week.

The foregoing remarkable case demands a record in this place for several reasons. I believe that I have never seen or read of one like it save that which is recorded herewith, and which so curiously resembles it in many points.

At first, many of the symptoms strongly suggested the idea that there was a hysterical basis for them. But the presence of fever, right-sided paresis, and wasting, with mental clouding, soon disposed of this view. For some weeks I believed that the case would fall into the category of tubercular meningitis.

When the pyrexia ceased at the end of three weeks, and the continuous wasting and spasticity made rapid progess, this view was no longer tenable, and I was for long much baffled in instituting any rational diagnosis.

It was clear that it was not a case of any "system" disease of the spinal cord, though there were characters in some respects allied to those seen in forms of primary lateral amyotrophic

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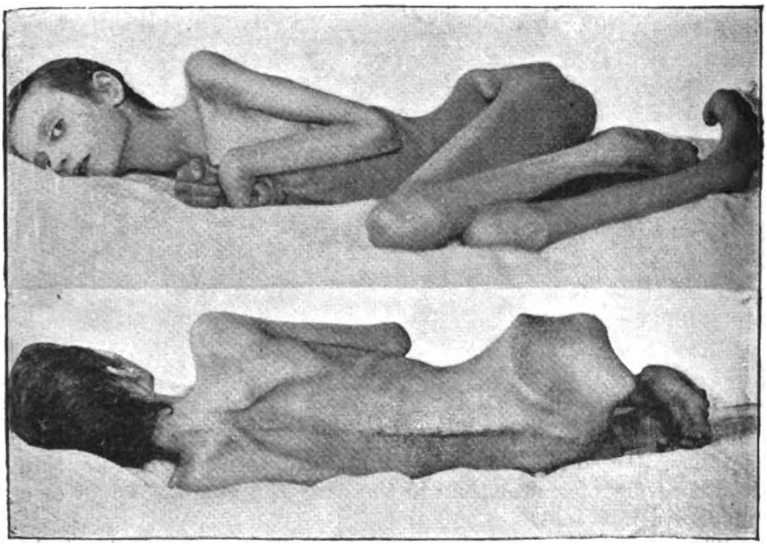
sclerosis. But there were head symptoms, and bulbar manifestations. Consciousness was absent for some time, and speech and articulation were involved.

The case was a very difficult one to manage, and would, under less favourable conditions, have certainly succumbed. Constant skilled nursing was necessary for months together. The entire absence of bedsores, although every care was taken to avert them, was surely not due only to these precautions. The special vulnerability of tissues, so common in cases of this kind, was markedly absent here, although the wasting was as extreme as could be conceived, and is well depicted in the accompanying drawings.



It is possible, therefore, to exclude a variety of morbid changes which appeared likely to explain many of the complex symptoms, and, by further observation of the case, to venture, though with some hesitation, on the diagnosis of a primary form of meningitis, which spread below the membrane and involved the cerebral cortex, leading to some degree of sclerosis of wide diffusion.

I am of opinion that the treatment by mercury and iodide of potassium in full doses was of considerable benefit in the earlier weeks of the disorder.

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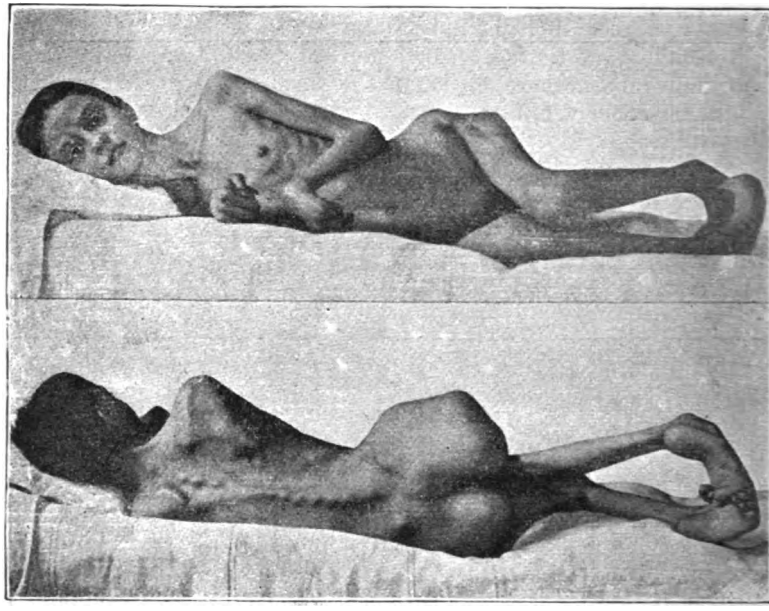
In explanation of the progressive improvement, which is so gratifying a feature of the case, I think we may bear in mind the age of the patient. The brain and nervous system are fairly well evolved at puberty, and yet these tissues are young and potentially disposed to further development and nutritional



activity. In so far there may be greater aptitude for retention and recovery of power than in the case of a much younger or a much older patient.

The general bodily health was in this case particularly good, and there were no specially malign diathetic proclivities present.

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## Dr. Tooth's Case.

Abstract.—*Ailing since death of mother—Onset marked by convulsive attack, followed by several others; then by a stupid drowsy condition, from which roused with difficulty—Weakness (paresis) of lower extremities—Nocturnal rise of temperature for six days—Flabby, semi-paretic condition of whole muscular system, gradually superseded by universal rigidity—Superficial resemblance to trismus—Peculiar emotional mental condition—Delusions—Insomnia—Whining tone of voice, with defective articulation—Peculiar inspiratory laugh—Inability to perform muscular movements to command—Some of such movements performed fairly well spontaneously—Extreme emaciation, gradually improving—Loss of control over sphincters—Absence of bedsores—No affection of sensation—Reflexes increased at first; diminished or absent later, on account of rigidity—General improvement under massage.*

B. L. T., a girl aged 13½ years. Came to the out-patient room at the National Hospital for the Paralysed and Epileptic, Queen Square, on July 4, 1892, with the following history.

She had been out of health since her mother's death five weeks before. On June 27 she had a fainting attack, and she has had several similar attacks since. The attacks present the following characters:—She appears to be semi-conscious, the left arm and leg are flexed, and the face is drawn to the left. She "goes white round the mouth." She does not struggle, does not bite her tongue, nor pass her water involuntarily.

Since the first attack she has not been herself at all, being stupid and drowsy; but since the last attack, on July 2, she has taken no notice of anything, hardly speaks at all, and will sleep all day and all night, if allowed to. At the same time the legs have become weaker, as if it were a great effort to support the body. She presents somewhat the appearance of a person in the drowsy stage of opium narcosis. She cannot feed herself, but is clean in her habits. The right knee-jerk is rather exaggerated, the left feeble. Temperature 100°.

*Past history.*—With the exception of a tendency to faint occasionally, she has been fairly healthy. No scarlet fever or measles.

*Family history.*—Mother died five weeks ago of heart-disease. A sister had had chorea.

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She was admitted into the Hospital under my care by the kind permission of Dr. Gowers. I am indebted for the account of the state on admission to the notes of Dr. Wood, the House-Physician, and Dr. Bruce, the Clinical Clerk.

The patient lies in bed like a person in a state of collapse. The eyes are closed, but when spoken to, she looks about in a vacant listless manner.

*Mental condition.*—Memory seems good. Attention is feeble. She is in a drowsy state, and requires stimulus of some kind to get her to speak or attend. She is constantly dozing. While she was being examined, she had two slight attacks of tremor, like a rigor, both of which she was able to control on being told to do so. There was a peculiar want of sensibility in the corneæ; an eyelash on the surface of the left appeared to cause no inconvenience.

*Eyes.*—The pupils are equal and react to light. There is slight nystagmus. Mr. Gunn subsequently examined the fundus, and reported that there was no sign of optic neuritis in either eye.

*Ears.*—Hearing certainly good.

*Muscular system.*—The muscles are flabby all over the body. There is no true paralysis of any muscles. The feet are extended, but can be moved voluntarily, as can also the arms and hands. The grasps are very feeble. In all the muscles there is a resistance to passive movements.

There is a slight incoördination in the movements of the right arm, but in no other limb. There is well-marked fine tremor of the hands and fore-arms on making any exertion.

*Nervous system.*—She volunteers no information, but when asked if she has any numbness or tingling, she says "yes." Tactile sensibility seems to be present, and a pin-prick is readily recognised. The skin is soft, warm, and perspiring freely. The perspiration is more free on the right side of the face than on the left.

*Reflexes.*—Skin perfect; plantars present and not exaggerated; knee-jerks present in both limbs, but rather exaggerated on the right side.

*Cranium* and *spine* show no signs of disease.

*Respiratory system.*—Respiration 36; rather irregular in rhythm and force. Thoracic and abdominal movement equal on both sides. Slight dulness over bases posteriorly, but no other signs.

*Heart-sounds* healthy; pulse 100, tension rather high.

For six days after admission the temperature rose every night as shown in the chart, but fell to normal every morning,

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the nocturnal rise becoming lower each night. It has been normal ever since.

About the sixth day after admission it was noted that though the muscular system was still generally flabby, yet, on raising the arm passively, it tended to stay in the position in which it was placed and to fall very slowly—a pseudo-cataleptic condition. The tongue was foul and dry, and the bowels obstinately confined.

On July 15, eleven days after admission, there was a slight rigidity of the muscles generally, more of the arms than of the legs. For some days she had ceased to speak even when spoken to.

The following admirable note of her condition on August 7 was made by Dr. Head, who was at that time assisting in the wards as Clinical Clerk:—

She is a small, undergrown child of 13½ years. She lies on her back, and exceedingly objects to being moved on to the

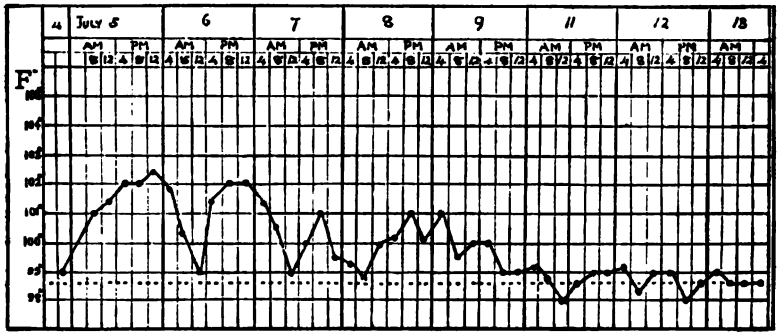


Fig. 1.—Temperature Chart during the first eight days after admission.

side. She follows every one with her eyes, and keeps up a continual whining high-pitched cry. The mouth is drawn up at one time with an inane smile, at another as if crying; the one passes into the other quickly without warning. She talks constantly in a high-pitched monotonous voice. What she says is intelligible, but the mouth is not opened, and the articulation is imperfect. The arms are flexed at the elbows, and either kept crossed over the chest or with the fore-arms pointing directly upwards as she lies on her back.

Both wrists are in a position of typical wrist-drop. The legs are rigidly extended, and the feet in a position of extension on the ankle. The thumb is flexed into the palm, but the fingers do not assume the interosseous position of tetany. The toes are



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not flexed towards the sole, but are in a line with the dorsum of the foot. There is definite rigidity of the neck muscles. This rigidity is, however, not simply a backward spasm; for when the hand is placed under the lower dorsal region she can be lifted off the bed in absolutely the same position as that in which she is lying. Thus she can be lifted from the bed as if she were a rigid bar. After a short time the spasm relaxes, and she bends at the hips like a mechanical doll, and she can be propped up in bed in the same rigid manner.

The wrist-drop of the left hand cannot be rectified without giving her pain; but the right wrist and both elbows can be extended by a little gentle manipulation, and the arm and hand then tend to assume the position into which they have been mechanically placed. The feet can be mechanically raised to a right angle with the legs with a little force, but no further; they rapidly reassume their previous position of extension on the ankle. Even when at perfect rest there is a constant fine

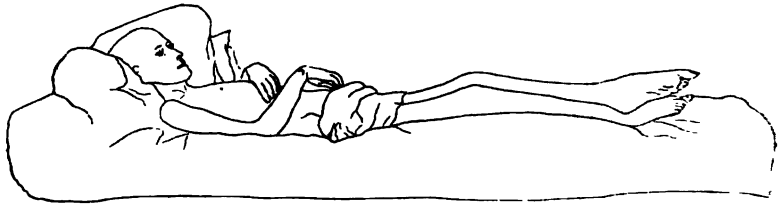

FIG. 2.—Outline from a photograph showing the position assumed by the patient about August 7.

tremor of the left hand and elbow. On movement a similar tremor appears in the right hand. No tremor in the legs.

There is extreme wasting of the body; the arms, fore-arms, hands, and the masseters are all extremely wasted. The face is pale, with an underlying pink flush; the lips and conjunctivæ are very anæmic. The ocular conjunctivæ are slightly œdematous, but not jaundiced. There is no œdema of face, back, ankles, or any part of the body.

The skin is moist, and occasionally she bursts out into the most profuse sweating. There is some redness of the lower part of the back, which might become a bed-sore.

*Nervous system.*—Her mental condition is very curious. She recognises people, and makes comments on what she hears, which are sometimes curiously apposite. As a rule, she keeps up a constant monotonous phrase, such as "I want to get up," or "Oh dear! doctor," &c. When spoken to, she can seldom be got to speak, but when she is talked about, she comments on what is said. She cries or smiles continuously, and without

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cause. The expression on her face is exceedingly like a "risus sardonicus," but is in reality a true expression of emotion, for there are times in which her face is at rest. She occasionally sings in a crooning kind of way. Thus, if the water-bed on which she lies is rocked, she will keep up a constant chaunt of "See-saw, see-saw." She complained of frontal headache, relieved by pressure, but this seems to have passed off during the last week. She sleeps exceedingly badly. She had marked nocturnal delusions, seeing some one in white at the bottom of the bed "frightening her." At first, she apparently saw her mother in white. Then her delusions changed, and her cry was, "Look at that girl at the bottom of the bed frightening me." This seems to have improved during the last week, but she does not sleep unless some one sits by her bed.

*Motion.*—She lies in the position described all day. Occasionally she makes patting movements with the right hand, and she makes slow and tremulous attempts to seize things with this hand. This movement of the right hand is the only movement she makes to command. She does not even uncross the legs when placed one over the other.

The spasm of all the muscles, excepting those of the left wrist, can be overcome by gentle steady force, and the limbs tend to assume the position in which they are placed, but slowly returning to their original position, to a great extent under the influence of gravity. All such movements are attended with marked tremor. Thus, there is even marked tremor of the jaw, when it is open or closed. She never turns her neck, but the face remains looking straight forward.

*Sensation*, as far as can be tested, seems to be good. Thus, she evidently feels when her legs are touched, and when they are uncovered for examination she says, "Cover them up, I'm cold." She cries when pricked with a pin, and appears to feel pain acutely. No hyperalgesia. No tenderness.

*Reflexes.*—Knee-jerk can be easily obtained in spite of the extended condition of the legs. Wrist-tap brisk both sides, especially on the left. Noticeable jaw-jerk. No jaw-clonus. No ankle-clonus, but it is difficult to overcome the extensor rigidity. Plantar and abdominal reflexes present.

*Cranial nerves.*—No ptosis. No ocular paralysis. No nystagmus, but whenever the eyes are moved, a little tremor appears at the commencement of the movement, and quite ceases when the excursion of the eyeball is complete. This fine tremor is seen also in the eyelids on movement. The pupils vary very much in size, without apparent cause. At one moment they are quite small, and then they may dilate to their

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full size as if under atropine. They react both to light and accommodation.

The sensation of the face, as far as it can be tested, appears fair.

The mouth is scarcely ever opened for more than half an inch, even to take food, but occasionally she opens it widely to yawn. No amount of urging will make her open her mouth farther than this, or put out her tongue. The spasm can be overcome with a gag, but returns slowly when the gag is removed. Very marked working of the masseter and temporal muscles. She dribbles, especially after food.

*Special senses.*—She evidently sees and hears well.

*Sphincters.*—She has complete incontinence of urine and fæces. Both are passed into the bed, but the urine does not dribble. She never indicates any desire to relieve herself.

*Spine.*—No curvature, no irregularity. No tenderness.

*Digestive system.*—Food hangs about the mouth and teeth; and although she swallows and takes food very well, she never clears her mouth with her tongue. Marked dribbling from mouth. Appetite good. Tongue was at first dry and brown, but now red and moist, covered with small brown patches, possibly aphthous. Bowels confined.

*Abdomen.*—Exceedingly retracted. Moves with respiration. The whole abdominal wall tightens when she coughs. No tenderness.

Her condition remained as detailed in the above note for two or three weeks. The temperature was normal all the time. She became extremely wasted, but contracted no bed-sore. She ceased to have delusions. The sleeplessness became less marked, but it is still necessary to use chloral occasionally.

After August 23 the extensor rigidity of the legs began to give way to a flexor rigidity, the knees being bent to an angle of 60°.

General massage has been regularly applied, and she has taken phosphate of iron internally, with the result that she has gained in weight and has obviously put on flesh, so that the face has filled out, but the body is still very thin, though much less emaciated than formerly.

On November 12 her condition was as follows:—She lies on her back with her elbows and wrists flexed, less on the right side than the left, and both knees drawn up.

She has a placid expression, with the lips rather apart, and the face is much filled out since the last note. She presents still an appearance resembling "risus sardonicus," but this is much less marked than at the time of the last note.

When spoken to, her face expands into a broad grin, becomes

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flushed, and then she gives vent to a long, noisy, indrawn laugh. It is little more than a long crowing inspiration, beginning softly, becoming very loud, and then dying away. It is never expiratory, as in ordinary laughing. She laughs with her whole face, and her general expression is one of great enjoyment.

She speaks in a whining monotonous manner, without any accompanying facial or lip movement, and apparently with very little movement of the tongue. It is possible, however, that spontaneous speech is plainer than that in answer to questions, for while this note was being taken she said quite distinctly and audibly, "When shall I be able to go home?" and when asked to repeat the question, she could only do so in her usual scarcely intelligible manner.

When asked to open her mouth, she cannot open it more widely than will allow a finger to be put in between the teeth. She cannot protrude the tongue much beyond the teeth, but she can, and frequently does, yawn widely, and when not noticed she can open the mouth well. It is the attempt to open the mouth *at command* that fails. She takes notice of everything in the ward. She understands perfectly the conversation going on around her, and shows her immediate appreciation of any pleasantry. Her nurse says she is more considerate of those around her than she was formerly, and tries not to give more trouble than is necessary. She is, however, very childish, and marks her disapprobation of anything by loud cries, out of proportion to the gravity of the stimulus which evoked them.

*Eyes.*—Pupils equal; act to light. There is no nystagmus. The field of vision is not limited at all.

*Upper extremities.*—Both in a state of considerable rigidity, most marked in the left arm. Both share in the general wasting, but they are certainly less wasted than they were a month ago. The skin of the palms and fingers is very soft and pink in colour. The nails are reeded; both hands sweat very freely.

The *right arm* lies at her side semiflexed at the elbow, the wrist extended, the first carpal bone extended on the metacarpal, the fingers evenly flexed in a moderate curve. The thumb is adducted so as to lie in the middle of the palm, but its two phalanges are extended. The movements to command are deliberate, and accompanied by much coarse tremor. She can bring her hand to her face, and when told to throw her doll at another child, she proceeds to do it deliberately, but fairly effectually. Her grasp to command is very feeble.

The *left arm* is adducted, but not strongly. Elbow acutely and strongly flexed, and cannot be extended without causing pain.

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Her wrist is acutely flexed, and cannot be straightened without the use of great force. The thumb is adducted across the palm, but its phalanges are extended on one another. The fingers are flexed in an equal curve, but not so strongly as to bring their tips to the palm. All these flexions can be overcome fairly, but the parts soon return to their original position.

The voluntary movements of the left hand are very limited; she can flex and extend her elbow slightly, wrist not at all, and she can also extend the carpals on the metacarpals, but she cannot move the thumb or straighten the fingers.

*Head, neck, and back muscles*, all rigid. When lifted from the bed, she shows no limpness of any part of the body. The head is fixed, with the chin raised. When asked to move her head in any direction, she shows the same deliberation and incompleteness of the act as she does with the limbs. When, however, she wishes to look at some object that interests her, she can move her head fairly well.

*Legs.*—Generally much wasted; extensors of thighs almost atrophied. Lower legs little more than skin and bone.

The knees are flexed to under a right angle, and the feet lie flat on the bed. Any voluntary attempt to move the legs results in a slight increase of the flexion. The feet can be voluntarily dorsiflexed slightly, and the toes move slightly to command. The knee-jerks cannot be obtained, probably on account of the rigidity. There is no ankle-clonus. The plantar reflexes are present, but are not exaggerated.

Sensation everywhere perfect.

The electrical reaction of the voluntary muscles all over the body have been carefully tested by Dr. Wood. His report is that all the muscles, even where apparently wasted, such as the anterior thigh muscles, react vigorously to faradic and galvanic currents of normal low strength. There is no reversal of the polar reactions to galvanism anywhere.

*Remarks.*—The case presents many interesting features, and at no time has the diagnosis been clear. The patient had always been a bright, cheerful child, when she lost her mother, an event which seems to have distressed her very much, and possibly may have been the starting-point of the present illness. At any rate, she was noticed not to have been the same girl since then. One month after that, she had certain "fainting attacks," which, however, presented no true epileptic character, and might have been functional in their nature. She then entered into a drowsy lethargic condition, with marked weakness of the limbs. When taken into the Hospital, she had some fever, which gradually subsided in six or eight days, but which of course may

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have existed for some time previous to her admission. The character of the chart does not suggest typhoid or meningitis, both of which diseases were in our minds at the time, neither does it altogether negative these diseases.

The condition of the muscular system presents several apparent contradictions. The flaccid paretic condition of all the muscles soon gave way to, first, a pseudo-cataleptic rigidity, and, finally, to intense general rigidity, at first extensor, then flexor. But this rigidity was general; there were no exceptions; it was tetanoid in its characters. The face presented the appearance of a "risus sardonicus;" the jaw was fixed; the head and neck were fixed, and so on down to the feet. This rigidity was always more marked when the patient was told to perform movements such as opening the mouth, but she often spontaneously performed actions which she could not do to command. At the same time the nutrition was profoundly affected, but this again was general, and could therefore scarcely be due to trophic influences in the ordinary sense of the term. Moreover, the electrical reactions of even the most wasted muscles were quite normal. The complete absence of bed-sores must be borne in mind in this connection.

The mental condition is also peculiar. During the febrile period she was semi-comatose, but could be stimulated into answering questions fairly rationally. With the subsidence of the fever and the appearance of rigidity she became highly emotional, suffered from insomnia, and at one time was subject to delusions. At the slightest provocation she was excited to tears or inane laughter. The laugh is so peculiar as to be almost *sui generis*. It differed from ordinary laughter in being inspiratory, and consisted of a long noisy crowing inspiration, accompanied by all the usual facial expressions in an exaggerated form. The voice in speech is also peculiar, of a whining high-pitched character, the words being so ill formed and run together as to be almost indistinguishable. An imitation of the articulation, without, of course, the peculiar intonation, is afforded by a patient with severe neuralgia, who is afraid to move tongue or lips, and no doubt it is caused in her by the inability to move tongue or lips on account of the rigidity affecting both. It is also possible that the high-pitched tone is due to a similar affection of the muscles actuating the vocal chords. Except for her emotional condition and the speech peculiarities, she is sharp and bright, understands everything that is said to her, evidently appreciates the conversation around her, and takes notice of everything that goes on in the ward. Occasionally she spontaneously speaks quite plainly, as in the instance recorded in

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the note (p. 277), but, as a rule, the more she is asked to speak up, the more unintelligible she becomes.

It is impossible from the facts to do more than guess at the pathology of this curious condition. There are many points in the case suggesting its being of a "functional" or "hysterical" nature, but that there must be some organic disease at the bottom is obvious from the extreme wasting and the paralysis of the sphincters. In all probability the fever and semi-comatose condition at the onset mark a sub-acute meningitis with corresponding general mild inflammation of the underlying cortex. It is yet to be discovered what extent of cortex and what groups of cells are affected to give rise to a *universal* muscular hypertonicity in which apparently rigidity is more marked than paralysis, and in which the higher mental functions have more or less escaped.

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ON THE

# COMPARATIVE ACTION OF BERTONI'S ETHER

## (TERTIARY AMYL NITRITE),

# AMYL NITRITE, AND ISO-BUTYL NITRITE.

BY

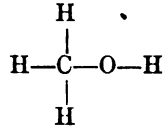
T. LAUDER BRUNTON, M.D., F.R.S.,

AND

T. J. BOKENHAM.

In 1887 Bertoni tried to find a compound having greater stability than ordinary amyl nitrite, while possessing the same utility as a remedy. He accordingly prepared the tertiary amyl nitrite. In order to understand the relationship of this compound to the others mentioned in our title, it may be advisable to give a short account of the chemistry of the alcohols from which they are derived, and of the terminology commonly adopted.

The simplest alcohol, methyl alcohol ($CH_3OH$), or, as it is sometimes termed, carbinol, consists of an atom of carbon, of whose four affinities three are united to hydrogen and one to the radical, hydroxyl (HO). Its formula is represented graphically thus:—



By replacing one atom of hydrogen by alcoholic radicals or alkyls, primary alcohols are formed, *e.g.*:—Ethyl alcohol, $CH_3CH_2OH$; propyl alcohol, $CH_3CH_2CH_2OH$; butyl alcohol, $CH_3CH_2CH_2CH_2OH$; amyl alcohol, $CH_3CH_2CH_2CH_2CH_2OH$, or graphically—

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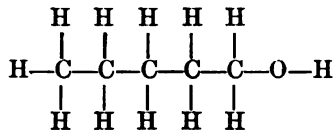

When two atoms of hydrogen in the carbinol are replaced by alkyls, secondary alcohols result, *e.g.* :—

Iso-propyl alcohol or dimethyl carbinol, $(CH_3)_2CH(OH)$; secondary iso-butyl alcohol, or ethyl-methyl carbinol,

$$\begin{matrix} C_2H_5 \\ CH_3 \end{matrix} > CH—(OH).$$

When all three hydrogen atoms in carbinol are replaced by alkyls, tertiary alcohols are produced.

As the number of carbon atoms increases in any alcohol, so does the number of compounds having the same percentage composition, but differing in the arrangement of their component atoms of carbon, hydrogen, and oxygen. Thus only one kind of methyl alcohol or ethyl alcohol is possible, but there are two propyl alcohols, four butyl alcohols, and eight amyl alcohols possible, viz., four primary, two secondary, and one tertiary. Many of these are actually known.

FORMULÆ OF THE AMYL ALCOHOLS.

Primary, (1.) $\begin{matrix} CH_2—CH_2—CH_3 \\ | \\ CH_2—CH_2—OH \end{matrix}$ (2.) $\begin{matrix} CH_2—CH < \begin{matrix} CH_3 \\ CH_3 \end{matrix} \\ | \\ CH_2—OH \end{matrix}$

(3.) $\begin{matrix} CH < \begin{matrix} C_2H_5 \\ CH_3 \end{matrix} \\ | \\ CH_2OH \end{matrix}$ (4.) $\begin{matrix} C(CH_3)_3 \\ | \\ CH_2OH \end{matrix}$

Secondary, (5.) $\begin{matrix} C_2H_5 \\ C_2H_5 \end{matrix} > CHOH$ (6.) $\begin{matrix} CH_3 \\ C_3H_7 \end{matrix} > CHOH$

(7.) Tertiary, $\begin{matrix} C_2H_5 \\ CH_3 \\ CH_3 \end{matrix} > COH$

From these formulæ it will be seen that tertiary amyl alcohol is dimethyl ethyl carbinol.

The difference between the alcohols and the nitrites consists in the replacement of hydroxyl (HO) by nitroxyl (NO).

The difference between Bertoni's ether, iso-butyl nitrite, and amyl nitrite will be evident from the following formulæ :—

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Amyl nitrite, $CH_3—CH_2—CH_2—CH_2—CH_2(NO)$

Iso-butyl nitrite, $\begin{matrix}CH_3\\CH_3\end{matrix}\!>\!CH—CH_2(NO)$

Bertoni's ether, $\begin{matrix}C_2H_5\\CH_3\\CH_3\end{matrix}\!>\!C(NO)$

The action of tertiary amyl nitrite was investigated by Bertoni himself, and also more thoroughly by Balp and Broglio. According to these, it is much more stable and less disagreeable to take than ordinary amyl nitrite. While it can replace the latter in the treatment of other affections, it is said to be especially useful in asthma and in cardiac diseases with imperfect compensation, when digitalis, caffeine, and other cardiac tonics fail. It is said also not to cause the flushing of the face

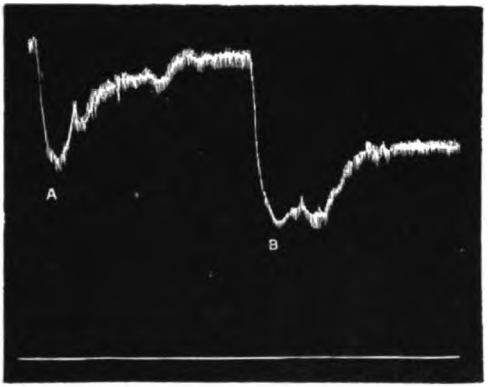


FIG. 1.

and the feeling of heat produced by ordinary amyl nitrite, but to encourage quiet sleep.

Dunstan, Woolley, and Williams showed that ordinary amyl nitrite of commerce is a mixture of nitrites, especially of *α* and *β* amyl nitrites, iso-butyl nitrite, ethyl nitrite, and propyl nitrite. These bodies having been isolated by Professor Dunstan, their physiological action was investigated, in some instances by Professor Cash, and in others by ourselves. We found[1] that the commercial amyl nitrite had distinctly greater power to lower blood-pressure than a mixture of *α* and *β* amyl nitrites (*vide* Fig. 1, in which A represents the action of *α* and *β*, amyl nitrites, and B that of commercial amyl nitrite on the carotid blood-pressure of a rabbit). The specimen of amyl nitrite used

[1] Pharmaceutical Journal, December 22, 1888.

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in these experiments was shown by Professor Dunstan to contain a considerable quantity of iso-butyl nitrite, and Cash showed that this body was more active than amyl nitrite. The same fact is shown by Figs. 2 and 3, which are taken from experiments of our own. The greater action of commercial amyl nitrite, as compared with that of pure $\alpha$ and $\beta$ amyl nitrites, was therefore in all probability due to the iso-butyl nitrite contained in the former.

Comparative experiments made upon rabbits, anæsthetised by

FIG. 2.

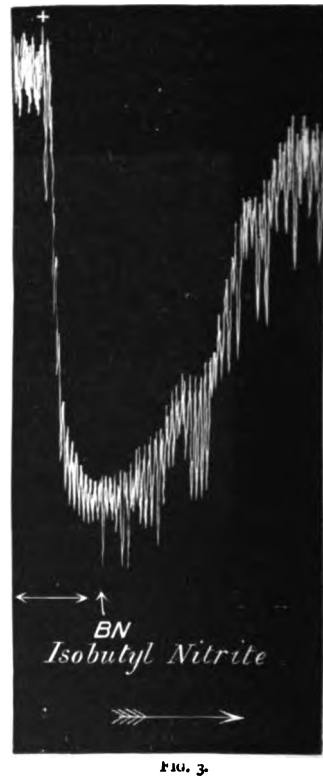


FIG. 3.

ether and then made to inhale the vapours of amyl nitrite or Bertoni's ether, showed that the fall of pressure with the latter was less rapid, and its recovery was also less rapid, than in the case of ordinary amyl nitrite. This will be seen by comparison of Figs. 4 and 5.

The two preparations were also tried on some cases in the wards of the Hospital; but while in one case Bertoni's ether

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seemed to be distinctly preferred, in another there was hardly

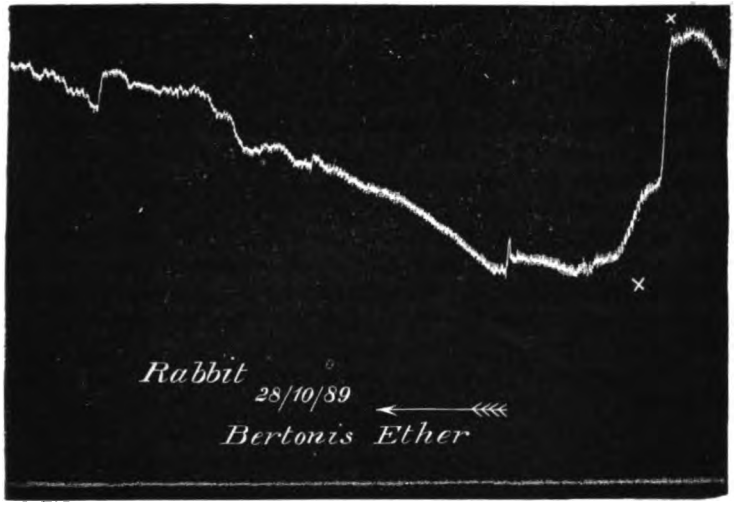


FIG. 4.

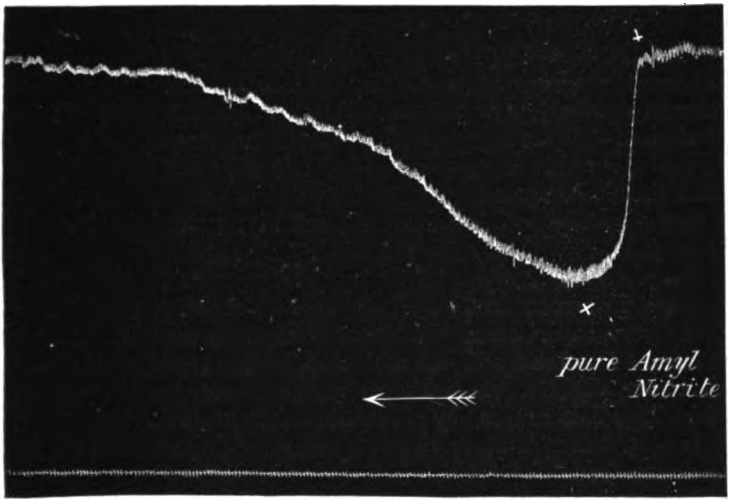


FIG. 5.

an appreciable difference in the action of this substance as compared with that of ordinary amyl nitrite.

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Case I.—C. G., aged 33, had rheumatic fever twenty months ago. Has had shortness of breath since, palpitation, and inability to do any work. Cannot use left arm; any exertion brings on pain in the heart. Orthopnœa at night for one year.

Has attacks of pain accompanied by sweating, chiefly at night. Pain is relieved by pharmacopœial amyl nitrite. The pulse is increased in rapidity during the attacks. Average is 96; during the attacks about 120.

Heart dulness extended to left.

Apex-beat is in sixth interspace, 1¼ inches outside nipple-line.

A double murmur is heard at the right base, and is audible all over the cardiac area. There is a systolic murmur at the apex of a different character from that propagated from the right base. Second sound is accentuated at the left base.

Had amyl nitrite nearly every night for three months, and was uniformly relieved.

On May 12 had a very severe attack, which was not relieved by tertiary amyl nitrite. He was sick very soon after the inhalation.

May 13.—Had a moderately bad attack at 4 A.M., which was relieved by tertiary amyl nitrite; but he says it made him feel sick.

Case II.—P. O'D., been ill four years or so. In January last lost his voice all at once; has had cough ever since. Difficulty in swallowing for one month, which has disappeared since admission. Never had syphilis. Great impairment of percussion on right side of chest in front; pulsation felt at second and third right interspaces.

Systolic and diastolic murmurs heard all over area of impaired resonance.

Heart's apex-beat not felt. By percussion it is found to be in sixth interspace, half an inch outside nipple. Systolic and diastolic murmurs heard faintly over whole cardiac area, louder at base. Paralysis of left vocal cord, which remains adducted. He snores slightly. Has almost incessant cough and dyspnœa. *which have been relieved by pharmacopœial amyl nitrite.*

June 5.—Cough was relieved by Bertoni's nitrite, and he had no discomfort.

June 10.—Cough ceased after taking Bertoni's nitrite. He says it relieved him more than the capsules of amyl nitrite.

June 11.—Had Bertoni's nitrite; says it relieved him much more than the pharmacopœial nitrite. He says that it made him sweat.

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June 12.—Cough ceased again on inhalation of tertiary amyl nitrite.

June 17.—Has had Bertoni's nitrite every morning; has had a fair night's sleep after it. It lessens the cough for a time, and so enables him to fall asleep. It has never made him sick, and he has only stated that it made him sweat on one occasion. He says that it makes his head throb more than the pharmacopœial preparation.

This patient died a short time afterwards, and the *post-mortem* examination showed that the trouble had been due to an extensive aneurysm.

The high price of Bertoni's ether tends greatly to interfere with its general application. As regards its stability, also, Dunstan finds that it does not possess any advantage over ordinary amyl nitrite, but, on the contrary, is less stable.

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# ON TYPHOID FEVER.

BY THE LATE

H. J. TYLDEN, M.B.

The history of typhoid fever embraces a period of something like seventy years. Typhoid fever begins with the recognition of its definite pathology between 1820 and 1830 by Bretonneau of Tours. It was still very imperfectly recognised, being confused with a number of other diseases, notably typhus, putrid, or jail fever. This part of the subject fell to English and Continental workers between 1830 and 1850. Jenner set the seal on this line of investigation by his publication in 1847, in which he clearly distinguished between typhus and typhoid.

The results of these investigations were to give the disease a definite pathology and a definite clinical standing. The question of ætiology still remained open. The first step was the recognition of its specific origin and its infectious nature. The word "specific" is empty, meaning simply produced by a special cause. What disease is not specific? But the recognition of a disease as infectious attracts attention to the cause as something real, and gives definiteness to the investigation. This view is expressed by Budd in the *Lancet* in 1860. He drew attention to the stools as the most important medium of poisoning, and infected water as more deadly and certain in its effects than infected air. It was clearly recognised that chiefest among the antecedents of typhoid fever was other typhoid fever, and this alone was sufficient basis for sanitary science to act upon. Its action was none the less efficient because two great questions still lay in the background.

The first was whether typhoid fever is always begotten of typhoid fever. This question, which still remains undecided, was keenly debated from 1870 onwards. The question is one of great importance even for sanitary science. If, as was originally maintained by Budd and Von Gietl, the cause of typhoid fever was a specific product of typhoid fever, then the



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sanitary outlook was promising in the highest degree. As the complaint is not in a high degree contagious, cleanliness and ordinary disinfection would do much to stamp out the disease, and this is a point not indefinitely remote. If, on the other hand, the excrementa of typhoid are only chief among possible causes, if, as Murchison and Jenner held, not without evidence, that typhoid might be generated by other putrescent matters as well, then the prospects of sanitary science are far less promising. Still it is no ground for its refusing to act.

This was the first question. The second concerned the special ætiology of typhoid. What was the something that was communicated? Doubtless already facts were in existence to point to the true virus—an organism. The efficacy of the poison when enormously diluted was consistent with this hypothesis alone.

Nevertheless, it is significant that important action was taken as regards the disease before either of these questions had been answered. The first question still awaits an answer. As regards the second, sanitary science began to be active many years before Eberth's bacillus had even been heard of. There is nothing remarkable about this; common-sense usually anticipates science; much can be done on the basis of general hypothesis.

The interval between 1865 and 1880 was prolific in typhoid outbreaks, and the issue of excellent sanitary reports by Drs. Thorne, Buchanan, Blaxall, and others. In 1867 Dr. Thorne investigated an outbreak in Winterton, in Lincolnshire. Again, six years later, Dr. Buchanan investigated an outbreak in Caius College, Cambridge, and pursued the demon of typhoid fever first into Tree Court, then into the branch main which supplied it, and the water-pipe of the staircase closet, finding all the conditions most favourable to the propagation of typhoid—intermittent water supply, unventilated sewer, untrapped excrement pipes. I shall only allude briefly to two other outbreaks. Catezham in 1879, again investigated by Dr. Thorne. This illustrated the diffusibility of the poison. A few typhoid motions produced between three and four hundred cases. Another showed that the intervention of a tract of porous soil was no obstacle to the contamination of a spring by a brook.

The precise study of the ætiology of typhoid, the search for an organism in the tissues and products, began as early as 1863. We may roughly divide it into two periods. There is the period previous to Eberth's discovery, ranging roughly from 1860 to 1880. There are few diseases which have not had

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their causes discovered several times over. Typhoid fever was no exception. During the twenty years, several organisms were credited with the disease, when their presence was accidental rather than essential. The chief workers should not be forgotten, Magnin, Cose and Feltz, and Klein. There is one point which attracted attention early, whose importance merits our attention at this early stage. In 1871 attention was called by Recklinghausen to abscesses in the kidneys in cases of typhoid fever, associated with the presence of micrococci; a fact about which we shall have more to say in the sequel. The second period begins with the work of Eberth. The paper in which he announced his discovery was preceded some eight years by a paper critical of the researches of others. In 1880–1881, the bacillus was discovered in the mesenteric glands, and in those of typhoid cases alone. This was confirmed by Klebs, Mayer, Coats, and Crooker. Already the polymorphism characteristic of the organism—the existence of long threads by the side of short rods—aroused controversy. The organism was successfully cultivated by Gaffky and others, who employed the methods of Koch.

*The bacillus.*—Perhaps its leading characteristic may be most fitly expressed by saying that it is typically atypical. There are few bacilli which present wider varieties of form, the conditions under which it varies being chiefly the age of the culture, the character of the medium—its reaction, moistness, dryness, &c. This renders it at once an easy and a difficult bacillus to work with. There is no difficulty about cultivating it. It is one of the freest and quickest growers among pathogenic organisms, but its tendency to amorphism perpetually raises the question of purity of culture. Add to this the fact that there is probably no one decisive test—we have to rely upon a number of tests. The most typical among its forms is perhaps that which it presents upon agar-agar—short stout bacilli with rounded ends, 2 or 3 $\mu$ long, and exhibiting active movements, which resist a considerable degree of heat, and staining solutions of considerable strength, so that it is easy to demonstrate movements in stained specimens. These movements involve change of position, but are chiefly vibratile movements executed upon the axis of the bacillus itself. They have been compared, and not inappropriately, to those of nystagmus. This we may conscientiously style the typical form. This form it exhibits on agar-agar, and to this it returns from other bizarre forms, when cultivations are made on agar-agar anew. The other forms exhibit a sufficiently wide range. The same specimen may show at once the short stout rods alluded to, shorter forms which

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resemble cocci, and long threads which extend over the entire field of the microscope, resembling anthrax threads, with intermediate forms of every variety. In such specimens, it is impossible to say whether the culture be pure or no: polymorphism is no proof of contamination. Its form varies with the media. If a culture be made from agar-agar in broth, for the first forty-eight hours the form begins to lengthen out. The same appearance is seen in the peritoneal fluid of animals which die early. Upon potato the cultures show short forms, but longer ones are frequent. The longer forms occur most frequently in old cultures; abscesses are places where they are frequent, also in old broth-cultures; in old agar-agar cultures they often run into smaller forms.

A few points in the further histology. (1.) Much has been made of a point in the histology of the appearance of a central unstained area between coloured ends. This is to be seen with tolerable frequency, especially in old cultures, but too much stress must not be laid upon it. It is not constant nor pathognomonic. Its signification is of interest: probably those observers are right who explain it as a sort of line of mortification which determines the place of fission in further multiplication.

(2.) The question of spores has been raised. Small round clear points at the ends of the bacilli were seen, but their existence is now not on the whole accepted. The following have been the main reasons against this:—(*a.*) The phenomena are not seen under favourable conditions in agar cultivations, nor upon alkaline potato, but only on acid potato at the end of some days. (*b.*) Spores resist heat longer than bacilli, but the forms in which these occur are slightly less resistant to heat than those without them.

(3.) The existence of vibratile cilia is on the whole accepted.

*Effects of staining reagents.*—They colour badly with aniline dyes, probably due rather to the ease with which the stain is washed out than to the slowness with which it is taken up. Gentian violet, fuchsin, and methyl blue easily stain them. Gram's method is not applicable.

*Cultivation.*—Easily cultivated upon most of the common media. There are great differences in the rate of growth and in appearance. Virulent cultures made freshly from animals grow with a rapidity far surpassing ordinary cultures. Again, the alkalinity of the medium is of importance, as is seen in cultivations made upon alkaline potato.

On gelatin, the first point of importance is that it does not liquefy. In stab cultures the growth does not stray far from the

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limits of the line of inoculation; small, yellowish, round, longitudinally arranged colonies appear on each side of the needle track; the whole appearance is that as of a delicate veil ending in a ragged fringe. The upper part of the culture sometimes darkens, a remark which applies to the cultures in other media. A curious fact which has been observed is the vaccination of the gelatin. Upon agar-agar, when made from media in which the bacillus is thinly scattered, it grows in small colonies. When made from cultures, it grows in broad streaks. It may overskin the entire surface, or it may be confined to a single track. Again, it may be transparent or thick. Upon potatoes, especially when alkaline, it grows rather freely, and with a growth quite colourless, so as to escape the eye. If the potato be previously boiled in salt solution, it grows in a thick yellowish layer. On carrot it grows badly. In milk it grows pretty freely, without curdling the milk; a certain amount of lactic acid is developed, probably enough seriously to interfere with the growth, but no curdling is produced. Upon sterilised meat it grows very freely, both over the surface of the solid and in the juice. Acid does not interfere markedly with its growth. In peptonised broth it grows freely, but with very different degrees of freedom, according to the virulence of the culture. A dull turbidity is usually developed in the lower part of the tube within the first twenty-four hours. It is characteristic of the bacillus that if it grows slowly, a cloud and deposit appears at the bottom of the tube, while the supernatant fluid remains clear. This is not always the case when the growth is rapid. In liquid media the growth of the organism is usually accompanied by the deposition of a precipitate at the bottom of the tube; at least this is the case in broth, alkali-albumin, and serum. It also grows in solutions of casein.

The relationship between its morphology and medium has already been alluded to. On fresh agar-agar the short form is almost universally predominant, but on older agar-agar it tends to forms shorter than the typical short rod, while on gelatin and in broth the tendency is for it to run into long threadlike forms or huge thick forms. In the peritoneal fluid of animals dead from peritoneal injections the forms are still short, but longer than on agar-agar. If death follow at a period remote at all from inoculation, the bacilli, if present at all, are usually atypical. Surfaces are evidently favourable to its growth. The bacillus of typhoid is potentially anaërobic, but it grows badly in deficiency or absence of oxygen.

A short recapitulation of the more important tests may not inappropriately close this part of our subject.

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Non-liquefaction and restricted growth upon gelatin; colourless growth on potato; growth in milk without coagulation; return to typical form on agar-agar from polymorphous growth on other media. To these we have to add two other tests, the decolourising action upon fuchsin, the other a clever test proposed by Kitasato.

*Experimental production of the disease in the laboratory.*—Some of the first workers found difficulties in producing the disease, and were disposed to regard it when produced as the result of toxic poisoning. They defended this view on the ground that sterilised solutions acted efficaciously, and that no evidence was to be found of multiplication of the bacillus in the system. This view has not on the whole been established by late research. In some recent experiments on white mice the result of small inoculations has proved usually deadly, and bacilli were found in the organs after death. The same observers experimented on rabbits with the same result, failing here to confirm the view of the earlier experimenters, that solutions after heating were as potent as before, for only two died out of ten when this process was performed. How this discrepancy is to be accounted for I do not know; possibly the degree of heat employed was different. Later investigations have led to the same result. Thus Cygneus, in 1890, produced it in mice, in nine out of sixteen rabbits, and in a few dogs, with lesions typical as far as they went, and bacilli. The precise dosage would be difficult to fix, especially when we consider the extent to which different cultures vary in virulence. It has been found that the period within which death occurs is very variable, varying from six hours to many days. We may take it as pretty well established that death can be produced with tolerable certainty with these cultures, and that bacilli are commonly present after death.

The common situations for bacilli in post-mortems on animals on the whole correspond with those in man, except that the peritoneal fluid offers them in greater abundance. In the spleen they are found almost always, in the liver and kidneys often. Cultures are made with greater difficulty from the heart blood.

The fate of the bacilli in the tissues has, however, been incompletely worked out. It would seem that the organism has great power of resisting as well as of destroying. They are not found after death with perfect regularity even in cases which succumb within the first forty-eight hours.

The lesions which have been described are, as far as they go, typical of typhoid fever. The most general is inflammation of the abdominal lymphatic system, or some part of it, swollen Peyer's patches, and enlarged spleen. Hæmorrhages are very

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common, and too little attention has been paid to them. Peritonitis is very common, and it occurs, moreover, not only when injection has been made into the peritoneum, but also in subcutaneous injections. It no doubt determines in many cases the speedy onset of death. On the bearing of the lesion on the general evidence we shall reserve what we have to say till presently.

The question of a set of phenomena described as secondary arises in connection with the question, Is the bacillus pyogenetic? Opinion has varied very much on this subject. At one time there was a disposition to believe that all ulcerations were due to secondary infection by other organisms—an opinion grounded on the discovery by different people of other microbes in the products of ulceration occurring in typhoid fever—especially Staphylococcus pyogenes aureus. Nor need we doubt the truth of this. But some doubt has been thrown upon the interpretation put upon them by the discovery that in many abscesses the typhoid bacillus, and that alone, can be demonstrated, while pure cultures can be made from them. This has been found true not only in cases of typhoid in man, but in abscesses experimentally produced in animals. There is every reason to believe that the bacillus is properly pyogenetic.

Sundry attempts have been made to produce immunity, and not altogether without success. Some observers have produced immunity in white mice by injecting boiled bouillon, and also by repeated inoculation of small doses. More recently Kitasato and Wassermann have produced immunity in guinea-pigs by injection of bouillon prepared from thymus (they call it "thymus-typhus-bouillon") which has been concentrated and kept at 60° C. for fifteen minutes. A considerable interval is, however, necessary to produce this—some ten days. But they find that immunity can be produced at a much shorter notice, indeed at an interval of only a day, by injecting a solution of the alcohol precipitate obtained from solutions concentrated at 80°–90° C. If the solution be first filtered through a Chamberland filter, they find it very much less active, and are led to conclude from this that the probable action is due to the bodies of the bacilli themselves, and not to any poison extracted from them. They have, however, confined themselves merely to bouillon. Further investigation is desirable on this head.

*General summary* on the conditions of the problem:—

"Is the cause of typhoid fever proved?"

If we revert to the conditions which are commonly insisted upon as necessary to be satisfied before a given organism can be related to a disease as cause and effect, they are these:—The

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constant presence of the bacillus in the tissues; the capacity to produce like lesions by means of the bacillus.

Now the first of these conditions has been fairly well satisfied, but how stands it with the second? It cannot be said that the attempts to produce the typhoid lesions have failed. Swollen Peyer's patches and enlargement of the spleen are fairly common—very common, I believe, if sufficient of the poison is injected. And yet most people will have a feeling that the proof does not stand on a basis as secure as tubercle. Why is this? In answering this question several points must be noticed. Firstly, the two criteria we have insisted on, though excellent as far as they go, are not exhaustive. Much depends upon the characters of the lesions in a disease. Why do the proofs of tubercle rest on so secure a basis? Not merely because the two criteria—constant presence of the bacillus post-mortem and the capacity to produce the lesions—are satisfied, but because the lesions in question are so very characteristic. This is the main reason why the proof is so satisfactory. Long pathology waited for a Koch to demonstrate the bacillus, but as soon as the bacillus was described and the lesion produced, they are so characteristic that the proof is triumphant. Now, as regards typhoid fever, it is true that as it occurs in clinical experience it is a very definite disease with a definite pathology. But this is due not merely to the actual lesions themselves, but to their manner of production, their course, and development. What constitutes typhoid fever so definite a thing to us is not merely the action of a given poison, but its introduction at a given point in the system at a given rate; and this, unfortunately, cannot be imitated in the case of animals with anything like success.

The natural way in which typhoid fever is produced is one thing—the laboratory way is another. Not that attempts to induce the disease by way of the intestine have been entirely unsuccessful, but when successful there are still differences from the course of events which occurs in clinical experience. This is partly due to causes unknown, partly, doubtless, to the lessened resistance of animals. I am not speaking of their resistance to typhoid fever, because as far as the intestine is concerned they seem to have a greater resistance than man. I speak of their resistance to disease as such. If every patient stopped eating in typhoid fever as soon as he became seriously ill, cases might be much shorter. Conversely, if animals could be nursed like patients, their illness might be prolonged. As it is, the attempts to produce the disease by the intestine either result in failure or else a huge amount of poison is introduced into the system,

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and though the animal dies of typhoid, it is not typhoid fever as doctors know it. We cannot imitate as yet, it would seem, either by the syringe or by feeding experiments, the method in which Nature doles out the poison to the system. And upon this the clinical features of the disease depend. There are more factors in the matter than merely a poison and an organism: there are the ways and means, the mode of introduction, and the degree. And the uniformity of Nature extends even to these details; if it did not, typhoid fever would be much more bizarre than it is. These details cannot be imitated. Still we must not understate our evidence. If the course and development of the lesions differ, they are, as far as they go, the same: they are lesions of the lymphatic system. Only, unfortunately, it has been so ordained that these lesions are not of a very definite or specific character, not by any means so definite as those of tubercle, for example. As they occur in clinical experience they are much more definite. What gives them this definiteness is not the primary nature of the lesions themselves, but their course and development, the time when the inflammation of the Peyer's patches begins, the time when sloughing begins, &c. All this we cannot imitate; we can imitate the lesions themselves, but unfortunately they are of a general nature. The poison is usually injected into the peritoneal cavity, but a score of poisons injected this way might produce these lesions. For what are they?—the reaction of the lymphatic system. It must not, however, be forgotten that the lesions do follow subcutaneous injections as well, a fact which materially strengthens the evidence; and that evidence is by no means weak. Even if we allow the flaw touched on, the facts still remain: the almost universal demonstration of a bacillus in the tissues of a typhoid fever patient, the capacity of producing like lesions by its means. The two points together form a strong basis; taken separately they are weak.

The fact that lesions of so general a nature could be produced by a given bacillus would be of no great value if it were not also a fact that this occurs in the tissues of a patient suffering from the disease. So that the case is a very fairly strong one. Two additional circumstances, if present, would make it stronger. If either the lesions were more specific, or if, being as general as they are, their origin and course could be exactly imitated. One criterion is satisfied; the other is in the strict letter, if not in the spirit. A bacillus is present in the tissues; by this bacillus the lesions can be produced, though the disease as it occurs in man cannot. And if difficulties occur here, so they do in other diseases. The course of tubercle in man is not identical with that in

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animals, nor even of anthrax. Meanwhile, the circumstances which baffle us are two. Animals are in one sense too resistant, in another not resistant enough. If their intestines were less resistant to the presence of typhoid we could produce the disease in a more typical way. If they were more resistant to disease as a whole, animals which die as they commonly do now with Peyer's patches enlarged, would live on into the ulcerative stage. In either case the results would be more typical.

Is death in typhoid due to the bacillus or to septic intoxication? The question is not an idle one, but really amounts to this, Does the injection consist of the bacillus alone, or does it contain a charge of prepared poison as well? Probably in nearly every case the symptoms and death are due to both. This is the most natural answer to give—either of the others are paradoxical. For consider the data. That a prepared poison may exist in considerable quantity is proved by the experiments made already early in the study of the disease with boiled and filtered solutions. These were far from being always deadly, but they were sometimes. And, again, the rapidity with which symptoms supervene upon the injection of a large quantity of an agar-agar culture favours this view. On the other hand, very small injections are sometimes fatal after a considerable lapse of time. It is also quite certain that certain places in the body, peritoneal fluid, for example, are favourable places of growth. Now an injection practically amounts to making a new culture on a favourable medium. So that in all probability death is due to a prepared poison, and a poison formed after the injection. The only way to arrive at a more precise understanding would be to inject with carefully washed bacilli. The question has received quite as much attention as it deserved, and has been answered somewhat too dogmatically.

Are ulcerations in typhoid fever due to the bacillus, or are they secondary? This question has not been answered, so far at least as concerns the ulcerations with which we are most familiar—those of the intestine. We may consider it as fairly well established that the bacillus of typhoid fever is capable of pyogenic action. This does not prove that every ulceration is due to such action, nor is it easy to see how, as far as ulceration of the intestine goes, the question could ever be answered. The intestine is swarming with other organisms; what part they take, if any, in producing the lesions of typhoid is more than we know. That the typhoid bacillus simply opens the door to other organisms which do the mischief is a statement

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that cannot be made. We know that such a hypothesis is not a necessity; the typhoid bacillus is, under certain circumstances, a pyogenetic organism; this does not prove that it is so in a particular case.

The chemical side of typhoid fever is not exactly untouched; it is, however, comparatively unknown ground. Brieger has already extracted a substance he terms "typho-toxin," and described its properties at length. As a rule, cultivations have been made in peptone broth, not in media more suited for the generation of poisons. Here much remains to be done. But some recent experimenters have opened a question of great importance in their late experiments on immunity. Their experiments warrant the conclusion that one of the places where protection may be looked for is in the bacillus itself; but what the chemical nature of this protecting agent is they leave undetermined, whether it is some form of nuclein or a ferment.

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Henry John Tylden, the youngest son of the Rev. W. Tylden, was born in 1857 at Starford Rectory, in Kent. He was educated at Uppingham School, where he entered under the late Mr. Thring when twelve years old. His school career was one of distinction; he obtained scholarships in 1870 and 1873, and eventually became captain of the school. He left Uppingham in October 1876, having gained a school exhibition, and was elected to an open classical scholarship at Exeter College, Oxford. At the University his school reputation was more than maintained; he was placed in the first class in classical moderations, and obtained the same distinction in the final school of literæ humaniores in Trinity term 1880.

For two years after taking his degree he remained up at Oxford, and his abilities earned him considerable reputation as a private tutor. But in 1882 he determined to devote himself to the study of medicine, and entered St. Bartholomew's Hospital in October of that year.

Though a brilliant scholar and with a profound training in philosophy, he had at this time no knowledge of the methods of the exact sciences upon which medicine is based, nor is it easy to imagine a greater change of mental attitude than is implied in the transition from transcendental philosophy to the dissecting-room; but his energy and power of application conquered the preliminary difficulties, and when he had once entered the domain of medicine proper, his previous training began to bear rich fruit. He obtained the Brackenbury Medical Scholarship

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in 1886, and having spent the following winter in Vienna, he was next year appointed House-Physician to Sir Dyce Duckworth, having graduated as Bachelor of Medicine at Oxford within four years of his entry upon medical studies. Among his papers are to be found notes and criticisms of medical cases, dating even from his student days, which betray a power of close and careful reasoning not always to be found in a trained and experienced physician. This was a not unnatural result of his previous training; it is a matter for greater surprise that he should have acquired the art of exact and minute observation of facts, which he possessed in no small degree.

In 1888 he was elected to the Murchison Scholarship at the College of Physicians—the highest academic distinction open to a student of medicine—and he became a member of that body in the same year. He was soon appointed Assistant-Physician to the Victoria Park Hospital for Diseases of the Chest, and in 1889 he became Casualty-Physician at St. Bartholomew's.

Dr. Tylden's natural bent was towards original research, and in order to qualify himself the better for this end, he determined to apply himself to the study of organic and analytical chemistry. This study he carried out at Zurich, and subsequently in London. His earliest researches were on diabetes and the pathology of the pancreas, the fruits of which appeared in a contribution to these Reports in 1891, and in a paper read before the Medico-Chirurgical Society in the present year. He found time, however, for other work. Among his papers is a complete and very characteristic "Essay on Galen," and a luminous essay on the subject of heredity in relation to disease appeared just after his death in *Nature*. His latest work was on typhoid fever, upon the ætiology of which he was engaged at the laboratory of the Colleges of Physicians and Surgeons when he fell a victim to the very disease he was studying during the past summer. A melancholy interest thus attaches to the foregoing essay, which has been found nearly complete among his papers. It is clearly of the nature of a preliminary essay, and does not embody some of his latest work. Nevertheless, it is so good a summary of the facts at present known, and so characteristically written, that it has been deemed fitting to publish it in these Reports as a memorial of a son of whom our Hospital may be proud.

F. A.

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# PROCEEDINGS

OF

# THE ABERNETHIAN SOCIETY

## FOR THE SESSION 1891–92.

OFFICERS.

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|---|---|
| *Presidents* | Mr. W. B. ADDISON and Mr. H. G. C. COOKE. |
| *Vice-Presidents* | Mr. H. M. FLETCHER and Mr. J. W. W. STEPHENS. |
| *Secretaries* | Mr. H. O. DAVIES and Mr. A. N. WEIR. |
| *Additional Committee-men* | Mr. M. A. COOK and Mr. W. G. RICHARDS. |
| *Treasurer* | Mr. W. MORRANT BAKER, F.R.C.S. |

*July* 10, 1891.

A summer meeting of the Society was held—Mr. W. B. Addison in the chair.

Dr. Thorne Thorne, F.R.S., read a paper on 'The Advisability of Treating the Infectious Fevers in General Hospitals.'

The meeting was largely attended by members, both of the Society and of the Nursing Staff.

*October* 8.

The Annual Introductory Address was given by Dr. Champneys.

*October* 15.

The first ordinary meeting was held—Mr. Cooke in the chair.

Mr. Addison showed an infant with various congenital malformations—hydrocephalus, cleft palate, and webbed hands and feet.

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Mr. Austen showed a case of favus. Mr. C. H. Roberts showed a specimen of the Achorion Schonleinii, prepared from the case when in the wards a year before.

Mr. Addison then read a paper on 'Some Points in the History of the Abernethian Society,' reading numerous extracts from the older minute-books.

Mr. Hoyle afterwards proposed that provincial men should be asked to read papers before the Society, and that the meetings be made more suitable for first and second years' men.

Messrs. Cook, Roberts, and Arkwright discussed the point, and pointed out difficulties.

*October* 22.

First clinical evening.

Mr. W. McAdam Eccles showed a case of granulomatous tumour on the flexor aspect of a finger, showing a microscopic preparation, and describing the pathology and treatment. He also showed a dermoid cyst in the middle line of the neck.

Mr. A. F. Stevens showed a case of paralysis of old standing of doubtful nature.

Mr. Gane showed a case of cyanosis, the cause of which evoked considerable discussion.

*October* 29.

The second clinical evening was held.

Mr. Cook showed a keloid over the sternum, also another of multiple lobulated growths over both legs and ischial tuberosities on several fingers.

Mr. Austen described a case of subacute nephritis grafted on chronic nephritis in a girl of twelve, in whom there was no history of scarlet fever or diphtheria. The heart was enormously hypertrophied and arterial tension increased. He also showed a microscopic preparation of the kidneys.

Mr. Arkwright showed six cases of locomotor ataxia. He noted that two came up for treatment on account of pains in the legs, one for weakness in the legs, one for gastric pain, and one for headache and warm sensations in the epigastrium. There was a definite venereal history in two cases, doubtful in the other four.

Mr. Dale showed a woman who had vaccinated herself on the face by kissing her baby.

Mr. Batten showed a man with cholesterin crystals in the vitreous humour.

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*November* 5.

Mr. Buchanan asked whether any steps had been taken by the Committee towards securing better accommodation for the Society's members.

Mr. Addison briefly laid the suggestions of the School Committee concerning a new smoking-room before the meeting.

Mr. Austen then read a paper entitled 'Some Conditions of Earth-Life considered Comparatively,' describing the conditions under which life existed on the earth, with special regard to variations of temperature, atmospheric pressure, moisture and light, and discussed the possibility of life existing on other members of the solar system.

Dr. Shore, and Messrs. C. R. Stevens, Eccles, Buchanan, Cooke, Scholefield, and Arkwright took part in the discussion which followed.

*November* 12.

Mr. Eccles showed the trachea and lungs of a child who had been tracheotomied for diphtheria. The wound had quite healed; but in the situation of the scar in the anterior wall of the trachea was a small papillomatous growth.

Mr. Hoyle showed a doctor's bill (paid) over 125 years old. He also described a case of poisoning by permanganate of potash.

Mr. Roberts showed six gynæcological specimens under the microscope.

Dr. Gow then read a paper on 'The Treatment of Malignant Disease of the Uterus.'

*November* 17.

Mr. Cropper showed a microscopic specimen of dermoid cyst-wall.

Mr. F. P. Webber then read a paper 'On the Significance of Albuminuria in Pulmonary Phthisis.'

He stated that the three chief forms of kidney affection met with in this complaint are :—

(i.) Lardaceous degeneration.

(ii.) Tubercular.

(iii.) Some degree of chronic interstitial nephritis.

He then described the influence of gout on phthisis, suggesting as possible causes for its apparently beneficial effect, the baneful effect of uric acid on tubercle bacilli, fibrosis of the lung hindering the spread of the disease, and, lastly, real opposi-

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tion of the two maladies, quoting Dr. Ormerod's paper on the subject. He then touched upon the effect of alcohol on these two diseases, citing cases as examples.

*November* 25.

Third clinical evening.

Mr. F. Johnson showed a man suffering from chronic bronchitis, and unable to open his eyes.

Mr. Eccles showed a man with lupoid patches on the backs of both hands and old strumous dactylitis of the ring-fingers.

He also showed a case of enormously enlarged veins over the lower part of the abdomen, probably secondary to a blocked inferior vena cava.

Mr. Cropper showed a microscopic preparation of tubercular meningitis, and another of sarcoma of ilium.

*December* 3.

Mr. C. B. Lockwood read a paper on 'Wound Infection,' beautifully illustrated by lime-light micro-photographic slides kindly shown by Mr. Cosens. The meeting was held in the Medical Theatre, and was very largely attended.

*December* 10.

Mr. Blackwell showed a microscopic specimen of anthrax.

Mr. E. C. Baker read a paper on 'Sarcoma of Bone.'

*January* 21, 1892.

Mr. Cooke showed a rash resembling tinea circinata.

Mr. J. C. Wright showed some of the pelvic organs from a woman with imperforate anus.

Mr. A. A. Bowlby read a paper on 'The Clinical Characters of Malignant Tumours.'

*January* 28.

The meeting fell through, a quorum not being present.

*February* 4.

Mr. Eccles showed a peculiar condition of the vessels of the arm (arterio-venous communication).

Mr. Addison also showed a case.

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Mr. Eccles then read a paper on 'Inguinal Colotomy,' dealing with the indications for the operation, the advantages of the inguinal over the lumbar method, and the details of the operation and after-treatment.

*February* 11.

Mr. C. R. Stevens read a paper on 'The Specific Fevers in the Puerperal State.'

*February* 18.

Dr. F. W. Andrewes read a paper on 'The Influence of Milk in the Spread of Disease.'

A discussion followed, one of the chief points of which was whether tubercle was absorbed from milk by the intestines and deposited in the mesenteric glands.

*February* 25.

Mr E. W. G. Masterman showed a case of thrombosis of the basilic vein, following an old injury to the thumb. He also showed two microscopic specimens, one of lymphangioma, the other of adenoma of the tongue.

*March* 3.

Mr. Scholefield showed a woman with polypoid growths in the larynx causing aphonia.

Mr. Masterman then read a paper on 'Rodent Ulcer.' He commenced by a short sketch of the history of the recognition of this disease, and then of its anatomy and process of development. Of the various theories as to its starting-point, he considered the outer sheath of the hair follicle most probable. From statistics the left side of the face seemed most frequently affected.

He then showed six cases illustrating various points in the disease.

The paper was illustrated by numerous Museum specimens and drawings.

*March* 10.

Candidates for offices during 1892–93 were nominated.

Mr. Weber showed a specimen of actinomycosis stained by an improved method.



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Mr. Addison showed a new form of support for cases of wry-neck.

Mr. Arkwright showed a bird of prey, whose identity could not be decided on by the members present.

Mr. F. C. Wallis then read a paper on 'The Surgical Treatment of Hydatids.' Basing his paper on his experience in Australia, Mr. Wallis advised free incisions in most cases, and deprecated puncture, as frequently fraught with danger, especially in hydatid disease of the lungs.

*March* 17.

Annual general meeting.

Messrs. Scholefield and Roberts were elected scrutineers of the ballot for election of officers.

The report of the out-going committee was read and adopted.

The balance-sheet was read and passed.

The result of the election of officers for 1892–93 was made known.

Officers for 1892–93:—

*Presidents*—Mr. E. Gane and Mr. C. R. Stevens.

*Vice-Presidents*—Mr. R. Brown and Mr. H. O. Davies.

*Treasurer*—Mr. Alfred Willett, F.R.C.S.

*Secretaries*—Mr. S. P. Cornish and Mr. E. W. Cross.

*Additional Committeemen*—Mr. J. Currie and Mr. G. J. R. Lowe.

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# DESCRIPTIVE LIST

OF

# SPECIMENS ADDED TO THE MUSEUM

## DURING THE YEAR 1892.

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# SPECIMENS ADDED TO THE MUSEUM

*During the Year ending September* 30, 1892.

DESCRIBED BY

EDGAR WILLETT.

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## SERIES I.

## DISEASES OF BONE.

**40a.** The Tibia, Astragalus, and Os Calcis, with a portion of the Fibula of the right side, removed by operation on account of long-standing Osteitis and Periostitis. The bones have been sawn through longitudinally, and show considerable thickening and deposition of new bone throughout the whole shaft of the Tibia, with almost complete obliteration of the medullary cavity. The inflammation, which originated in the Tibia, has spread to the neighbouring bones, causing complete obliteration of the Ankle and Astragalo-calcaneal joints, with firm bony ankylosis of these bones to each other and to the Tibia. The Fibula, which has also been sawn through longitudinally, is firmly ankylosed to the Tibia and Astragalus, but its medullary cavity has not been encroached upon by the thickening of the bone. The outer surface of the Tibia is for the most part smooth, with the exception of an oval patch measuring three inches in its long diameter, and situated on the inner surface of the lower third: this marks the seat of an ulcer of one year's duration.

**74a.** A Right Tibia showing in a very marked degree the changes due to Osteitis Deformans. The bone has been sawn through longitudinally, by that means displaying the fact that the greatly increased thickness of the bone is almost entirely due to the deposition of new material on the outer surface, and that the medullary cavity has not been encroached upon.

This deposition is almost entirely confined to the anterior and posterior surfaces; the result is that while the bone is much thicker when measured from before backwards, from side to side it is of about the normal size: further, the triangular shape of the Tibia is lost; the sharp crest and the internal and external borders are quite obliterated. It may also be noted that the upper two-thirds are more

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affected than the lower part, that the head is but slightly thickened, and the lower end is of normal size. The surface of the upper part of the shaft is rough and porous, and is pierced by numerous blood-vessels: the orifice for the nutrient artery shows that this vessel was of large dimensions.

This and the succeeding specimen (a right radius) were removed from an old woman aged 67; each of them measured ¾ to 1 inch more in length than the corresponding bone of the opposite side; they were the only bones affected; no others, including the bones of the skull, showed any increase in size.
See *Female Surgical Register*, vol. v. (1891), No. 2639*.

**74f.** A Right Radius from the same case as the preceding specimen, and affected like it by Osteitis Deformans. The bone has been sawn through longitudinally, and shows, as usual, that the increase in thickness is due mainly to a deposition of new bone on the outer surface. The general shape of the shaft is quite lost, and there is a well-marked anterior bowing; on either side of the attachment of the interosseous membrane the surface is much roughened and slightly porous in appearance, as is also the insertion of the Biceps Tendon. At the lower end the tendons of the Supinator Longus and Extensor Proprius Pollicis have formed grooves on the dorsal aspect of the shaft. At both extremities, especially at the lower, the margins of the articular surfaces are surrounded by rough deposits of new bone.

**210a.** One Half of the Upper Part of a Right Femur which has been sawn through longitudinally. The Great Trochanter is hollowed out and contains in its centre an oval Sequestrum, measuring more than an inch in its long diameter: it is covered with soft granulations, and the cavity where it lies is lined by the same material. A small Sinus led down from the top of the Trochanter to the Sequestrum. There is another abscess cavity filled by curdy pus in the lower part of the neck.

From a patient aged 50. Forty years previously she had been under the care of Sir William Lawrence for disease of the hip-joint.
See *Female Surgical Register*, vol. ii. (1889), No. 2586.*

**444a.** A Portion of the Left Inferior Maxilla, extending from the Symphysis to the Angle, which was removed by operation on account of a large bony tumour occupying the greater part of the Ramus. The tumour has been sawn through longitudinally, and the outer part is suspended above the inner and larger portion. The whole side of the Jaw is expanded on the inner as well as on the outer side, and is hard to the touch. Microscopical examination showed that it was a Fibro-Sarcoma.

See *Male Surgical Register*, vol. v. (1890), No. 2740.

**453a.** A Large Sarcoma involving the Lower End of the Left Femur. A longitudinal section has been made, and shows that the growth has involved the lower end of the bone so extensively that the Condyles and the neighbouring parts can no longer be traced. The shaft of the Femur ends abruptly in a dark-coloured mass, which consists largely

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of irregular cysts. When fresh, the material in these cysts was soft and deeply blood-stained. The mass has grown mostly towards the popliteal space, but it also extends in front of the original outline of the bone, and into the medullary cavity itself. The articular cartilage can still be identified, and the Knee-Joint does not seem to be directly involved. Under the microscope sections showed the growth to be a typical Myeloid Sarcoma.

From a middle-aged woman who also suffered from a goitre. She died the evening of the day on which the amputation was performed.

The goitre is preserved in Series xxvi. No. 2314h, and a cast of the limb in Series lvi. No. 11a.

See also *Female Surgical Register*, vol. v. (1889), No. 958.

**470a.** One Half of the Upper End of a Right Tibia, which has been sawn through longitudinally. Growing from the interior of the bone and expanding it externally is a large mass of new growth; in the deeper parts it has a fine spongy appearance, which was blood-stained when fresh, but is now only faintly mottled; more externally it is homogeneous in character. The outer layers of the bone are much thinned and expanded on the external surface, where it could be cut with a knife, and from which portions of the bone have been removed. On the cut surface of the interior there is a sharp line of demarcation between the growth and the bone. The articular cartilage, though much thinned over the outer facet, has not given way, and the joint was not affected. Under the microscope the tumour proved to be a Myeloid Sarcoma with some hyaloid degeneration of a few of the myeloid cells.

The patient was a gentleman aged 50, who two months before the operation had knocked his knee. A swelling shortly appeared, over which "egg-shell crackling" was detected; amputation was then performed; eighteen months after the operation he was in good health.

Microscopical sections are preserved in Series lv. No. 39.

Presented by Thomas Smith, Esq.

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## SERIES II.

# DISEASES OF JOINTS.

### SENILE TUBERCULOSIS.

**570c.** The Left Hip-Joint, laid open from the front, and showing, as the result of prolonged suppuration, complete destruction of the head and of a considerable portion of the neck of the Femur. The cartilage round the margin of the Acetabulum is eroded, and there is a perforation at the deepest part of the socket, through which pus had tracked into the Pelvis.

The patient was a woman aged 53, who had suffered from pain in the left hip for nine months previous to her admission into the Hospital. She then had all the signs of acute hip-disease. The joint was incised and pus evacuated. Her general health rapidly became worse, and she died three months later from exhaustion. The

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*post-mortem* examination showed that both lungs, both adrenals, the right kidney, and several abdominal lymphatic glands were the seat of advanced tuberculosis.

The lymphatic glands are preserved in Series xxiv. No. 2284a.

See *Female Surgical Register*, vol. iv. (1890), No. 143.

**729a.** The Left Hip-Joint from a child six years of age, on whom the operation of excision (removal of the head of the Femur) had been performed two years previously. There is a slight rounded eminence at the extremity of the neck, and this is firmly connected with the bottom of the Acetabulum by fibrous bands. The Muscles round the Joint are somewhat wasted and matted to each other and to the Capsule of the Joint.

The head of the bone was removed by the anterior incision and the wound closed without drainage: primary union resulted. She died two years subsequently from general tuberculosis following influenza. For details of the case see *Clinical Society's Transactions*, vol. xxiii. (1890), p. 98.

Presented by C. B. Lockwood, Esq.

**739a.** A Section through the Lower End of a Femur. The Knee-Joint had been excised previously, and an ivory peg was at the time driven through the Tibia into the Femur to fix them together. This can now be seen in section; its presence did not cause any irritation. A useful limb did not result, and amputation through the Femur was subsequently performed.

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## SERIES III.

## INJURIES OF BONE (FRACTURES).

### SEPARATION OF EPIPHYSIS.

**758b.** One Half of the Lower End of a Radius and Ulna which have been sawn through longitudinally, showing, as the result of an accident, the separation of the Lower Epiphysis of the Radius from the Shaft.

From a boy aged 16, who was brought dead to the Hospital.

See *Surgical Post-Mortem Register*, 1889, p. 86.

### UN-UNITED FRACTURE OF TIBIA.

**858a.** The Left Foot and Lower Part of the Leg of a Child, showing an Un-united Fracture of the Tibia at about the middle of the bone. The upper fragment is well grown, and its broken end is enlarged and thickened by a fair amount of Callus. The lower end is tapering and atrophied to half its proper size. The Fibula has also been broken, but has united firmly; its broken ends have become displaced inwards behind the Tibia, and project half an inch behind its inner margin; in consequence the Fibula has lifted the Posterior Tibial Artery and Nerve away from the Tibia. This disturbance in the blood-supply is possibly one of the causes of the non-union.

The patient was a little girl aged 2½ years. Three wiring operations had been done without effect. Amputation was then performed.

Presented by C. B. Lockwood, Esq.

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## SERIES V.

# DISEASES AND DEFORMITIES OF THE SPINE.

**FRACTURE-DISLOCATION OF SPINAL COLUMN.**

**1164a.** The Sixth and Seventh Cervical and Five Upper Dorsal Vertebræ, in which, as the result of a severe accident, there has occurred a fracture-dislocation at the junction of the Cervical and Dorsal Regions, with a comminuted fracture of the body of the 4th Dorsal Vertebra and fracture of the 3rd and 4th Dorsal Spines. The specimen has been sawn through longitudinally a little to the right of the middle line, exposing the Membranes without encroaching on the Spinal Cord. It is seen that the Cord has been completely severed opposite the upper injury, and that it is also crushed and compressed opposite the lower.

From a man aged 44, who was brought dead to the Hospital.
See *Surgical Post-Mortem Register*, 1887, p. 177.

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## SERIES VI.

# INJURIES AND DISEASES OF MUSCLES, TENDONS, AND BURSÆ.

**1207a.** A greatly enlarged Bursa Patellæ which was removed by operation. It has been laid open from behind. On the front wall there is a deposit of blood-stained fibrin. Considerable hæmorrhage had taken place into the cavity of the Cyst a short time before the operation.

See *Female Surgical Register*, vol. iv. (1891), No. 1033.

**1214a.** An enlarged and greatly thickened Bursa Patellæ removed by operation. Its cavity is occupied and nearly filled by nodular masses of coagulated Fibrin with a rough shaggy surface. A portion of Skin is still adherent to the lower end of the specimen.

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## SERIES VII.

# DISEASES AND INJURIES OF THE PERICARDIUM AND HEART.

**TUBERCULAR PERICARDITIS.**

**1231a.** A Heart to which the Pericardium is universally adherent. The Heart is enlarged, and weighs 17 oz. with its covering. In front, the

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Pericardium has been incised and partially detached; on its inner surface and on the surface of the Heart numerous Tubercles can still be seen imbedded in the coagulated fibrin. They are now much less distinct than when the specimen was fresh. Examination of the interior of the Heart showed that the Valves were normal and unaffected.

The patient was a sailor boy aged 16. He was admitted into Hospital only three weeks before his death. During his illness he never complained of any pain, and, with the exception of a markedly hectic temperature, did not seem ill. Coma, probably due to tubercular meningitis, set in the day before his death. At the *post-mortem* examination his lungs, liver, and spleen were all the seat of recent tubercular inflammation.

Presented by Surgeon Gipps, R.N.

**1299f.** A Heart which has been laid open so as to expose fully the Left Auricle and Ventricle. The auricular surface of both Mitral Valves is covered with a mass of thick vegetations, of almost fleshy consistency when fresh, and which nearly blocked the Auriculo-Ventricular Orifice. Another large mass is attached to the ventricular aspect of one of the Aortic Cusps. The cavities on the left side are slightly dilated, but the walls are not hypertrophied. The right side is unaffected.

See *Medical Post-Mortem Register*, vol. xviii. p. 51.

**1330a.** A Heart from a fatal case of Chorea. On the auricular surface of the edges of both cusps of the Mitral Valve there is a row of small granulations completely surrounding the orifice. When fresh, some of these felt soft to the touch, others were rather firm. In other respects the Heart is normal.

From a girl aged 16.
See *Medical Post-Mortem Register*, vol. xvii. p. 353.

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## SERIES VIII.

# DISEASES AND INJURIES OF ARTERIES.

### ABSCESS OPENING INTO AORTA.

**1439a.** The Heart, Arch of the Aorta, and neighbouring parts of a Child aged four years. At the commencement of the Descending Aorta there is a small ragged opening on the posterior wall, through which a red glass rod has been passed; this leads into a Sac measuring 1½ inches in diameter situated in the concavity of the arch of the Aorta: on the side near the Heart the walls of the Sac are well formed, but at the upper and outer side the walls are ragged and indistinct, merging in places into recent blood-clot. The origin of the Sac is obscure, but it probably is the remains of an enlarged Lymphatic Gland which has "broken down" and has subsequently communicated with the Aorta after ulceration of the intervening tissues. The outer surface of the

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Heart is covered with flaky deposits of recent lymph due to acute Pericarditis, which was the cause of death. The Endocardium is not affected.

See *Medical Post-Mortem Register*, vol. xviii. p. 349.

**1441a.** A Portion of the Left External Iliac Artery. There is a large irregular rent in the vessel leading into an abscess cavity which had formed in the Psoas Muscle owing to Caries of the Lumbar Vertebræ.

The patient was a young woman aged 20, who had suffered for a long time from disease of the spine. At the autopsy the psoas muscle was found to have been entirely destroyed, and its sheath was distended with blood.

See *Surgical Post-Mortem Register* for 1890, p. 92.

**FUSIFORM ANEURYSM OF A RIGHT AORTIC ARCH.**

**1450a.** A Heart together with the Arch of the Aorta, Larynx, Trachea, and Œsophagus, where, as a congenital abnormality, the Right Aortic Arch has persisted, passing behind the Trachea and Œsophagus to reach the left side of the Spinal Column. As other abnormalities, the two Common Carotid Arteries arise separately, but close together forming the first branches, the right and left Subclavian Arteries being the next vessels, one on either side of the Trachea: the right Recurrent Laryngeal Nerve passes, as is usual in this variety, beneath the Aorta, instead of beneath the Subclavian. Immediately above the origin of the Carotids and at the junction of the ascending and transverse portions of the Arch, the whole vessel is enlarged and dilated, the enlargement passing down to and gradually fading off at the origin of the Cœliac Axis (see next specimen); the surface of the Aneurysm is irregular and nodular, it has largely displaced both the Trachea and Œsophagus; it caused severe Dyspnœa, and later on Dysphagia and Paralysis of the right side of the Larynx. The Arch of the Aorta rises much higher than usual, and the Heart itself is considerably enlarged: the remains of the Ductus Arteriosus is seen passing from the top of the Pulmonary Artery to the left Subclavian.

The patient was a man aged 39, who died about eleven months after the onset of symptoms.

The specimen is probably quite unique, only twenty instances of this anatomical variety being known, none of which are described as aneurysmal.

Presented by W. P. Herringham, M.D.

**1450b.** The remaining portion of the Thoracic and Abdominal Aorta from the preceding specimen (to which refer). In the main, the aneurysmal dilatation ceases at the origin of the Cœliac Axis.

**SPONTANEOUS CURE OF AORTIC ANEURYSM.**

**1548a.** One Half of a Large Aneurysm of the Abdominal Aorta which has undergone spontaneous cure. The Sac, which is hemispherical in shape, measures 3 inches in its long diameter; it has been cut through longitudinally with the portion of the Aorta with which it was connected; its cavity is nearly filled by a laminated whitish Clot. This is firmly adherent above and below to the walls of the Sac, which are much thickened at these situations: over the most prominent part the walls

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of the Sac are separated from the clot by a narrow space which contained blood-stained fluid. There is a ragged irregular opening from the Aorta into the Sac, in front of which, and for an inch downwards between the aortic walls and the clot, is a space into which the blood current passed. The Aneurysm was situated immediately below the Diaphragm, and although both the Œsophagus and Pancreas passed in front of it, they were not adherent to it.

The patient was a man aged 35, who died from septicæmia.
See *Medical Post-Mortem Register*, vol. xv. p. 280.

## SERIES X.

## DISEASES AND INJURIES OF THE LARYNX.

**1623a.** A Larynx, Trachea, and the two Bronchi. There is marked Œdema of the Glottis, for the relief of which tracheotomy was performed. There is also necrosis of both Arytenoid Cartilages and of the Cartilages of the Trachea, which have been divided in the tracheotomy wound. The Mucous Membrane over the whole of the Trachea and of the Bronchi is ulcerated and completely disorganised, and is converted into a rough velvety membrane. There is also the depressed scar of a healed Ulcer on the left edge of the Epiglottis.

See *Medical Post-Mortem Register*, vol. xviii. p. 90.

### LEPROSY OF THE LARYNX.

**1624a.** The Larynx of a Man aged 34, who for ten years had suffered from Leprosy. The Mucous Membrane covering the posterior surface of the Epiglottis, the true and false Vocal Cords, and the Thyroid Cartilage is ulcerated in an unusual manner, leaving a few thin irregular bands, which are undermined owing to the destruction of the submucous tissue.

Six months before the patient's death the larynx became involved, and tracheotomy was performed.
See *Pathological Society's Transactions*, vol. xlii. p. 37.

**1656d.** A Larynx on which Excision of the Vocal Cords was performed on account of Epithelioma: it has been laid open from behind. The situation of the Left Vocal Cord is occupied by an excavated irregular Ulcer, which extends down to and exposes the Thyroid Cartilage. A similar Ulcer, but a less extensive one, has involved the anterior half of the Right Cord. A tracheotomy wound is surrounded by a large abscess cavity between the front of the Trachea and the Skin.

The patient was a man aged 60.
See *Male Surgical Register*, vol. ii. (1889), No. 1593.

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**FOOD IMPACTED IN THE LARYNX.**

**1660b.** The Larynx and Upper Part of the Œsophagus of a Man who was brought dead to the Hospital: the specimen has been laid open from behind, disclosing a mass of partly masticated Bread which is firmly impacted at the upper part of the Œsophagus, and effectually closes the entrance to the Larynx.

**1662b.** A Pebble which was swallowed and passed through the Larynx into the Trachea of a Man. After remaining in the air-passages for forty-five hours it was expelled by coughing.

For notes of the case see *Lancet* (1863), vol. ii. p. 277.

Presented by Henry Power, Esq.

## SERIES XI.

# DISEASES AND INJURIES OF THE PLEURA, BRONCHIAL TUBES, AND LUNGS.

**1740a.** A Portion of the Left Lung showing numerous secondary deposits of Sarcoma, these are well seen both on the pleural and on the cut surface. The primary disease occurred in the Thyroid Gland, and was of extremely rapid growth.

The thyroid gland and surrounding parts are preserved in Series xxvi. No. 2318c, to which refer for a history of the case.

## SERIES XII.

# DISEASES AND INJURIES OF THE NOSE, MOUTH, TONGUE, PALATE, AND FAUCES.

**CONGENITAL CYST OF THE TONGUE.**

**1779a.** The Specimen consists of a nearly Spherical Cyst, measuring three inches in diameter, and occupying the anterior portion of the Tongue: it is situated below the muscular layers, which are thinned out and expanded over the Cyst: the Mucous Membrane over the anterior half of the lower surface is a good deal thickened: at the sides large blood-vessels can be seen running along the margin between the cyst wall and the muscles.

The patient was a child aged 3: a large cyst existed at birth and was tapped, but filled again rapidly: the cyst and portion of tongue now seen protruded constantly from the mouth, which could not be closed: the surface was dry and excoriated and the lower jaw greatly expanded, and the anterior half bent downwards, so that after the removal of the cyst the mouth could not be shut. The teeth were everted, and the

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intervals between them were at least twice as large as usual. The cyst contained semi-purulent fluid. Microscopical examination of its walls showed them to be composed of fibrous tissue only. There was no evidence of any "dermal" origin.

Two photographs of the child, taken before the operation, are preserved in Series lvii. No. 177d.

Presented by Stephen Paget, Esq.

**1782a.** A Tongue removed by operation on account of a large Ulcer situated on the Dorsum of the anterior half. The edges are sharply defined, and the affected area is slightly raised and fissured in places. There is, however, little or no loss of substance. Microscopical examination of the central portion showed no epithelial ingrowth nor other signs of malignant disease.

See *Male Surgical Register*, vol. iv. (1890), No. 1772.

**DIFFUSE PAPILLOMA OF TONGUE.**

**1785a-1.** A Portion of a Tongue, on the Dorsum of which is a Circular Patch one and a half inches in diameter, where the Papillæ have undergone a general Hypertrophy, producing a rough and shaggy appearance. On the cut surface the tissue immediately below the growth looks to the naked eye as though it were infiltrated by a malignant tumour; under the microscope, however, this is seen to consist only of inflammatory small cells, and there are no signs of Epithelioma.

**1785g-1.** A Lymphangioma of the Tongue removed by operation. The part most affected is an oval patch measuring one inch in its long diameter, and is covered by a number of small cysts, which, when fresh, were white and translucent and contained a clear fluid. Microscopical examination showed that these are formed by dilatation of the Lymphatic Spaces.

The patient was a girl aged 14, who had noticed the growth for two years.

See *Female Surgical Register*, vol. v. (1892), No. 563.

A drawing of the tongue before operation is preserved in Series lvii. No. 176d, and microscopical sections in Series lv. No. 204a.

**1785g-2.** A Small Lymphangioma of the Tongue removed by operation. On the right side of the specimen are a number of small processes; when fresh, these were seen to be vesicles filled with a clear fluid.

The patient was a boy aged five who had previously undergone an operation for the removal of a similar growth. Owing probably to an incomplete removal, it recurred till it reached the size seen, and was then freely removed by the knife.

A drawing of the tumour before the first operation is preserved in Series lvii. No. 176b.

See *Male Surgical Register*, vol. i. (1890), No. 725.

**1791a.** The Left Half and Posterior Portion of a Tongue removed by operation for recurrence of an Epithelioma. A section has been made through the ulcer, which is seen to have raised edges and to have extended deeply into the substance of the Tongue.

From a patient 75 years of age. The first operation had been performed some years previously.

**ENLARGED TONSILS.**

**1806a.** The Pharynx of a child exposed from behind, showing on each side chronic Enlargement of the Tonsil.

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## SERIES XV.

# DISEASES AND INJURIES OF THE PHARYNX AND ŒSOPHAGUS.

**1833a.** An Œsophageal Diverticulum removed by operation: it measures rather more than an inch in length, and is composed mainly of striped-muscular tissue with a lining of Mucous Membrane.

The patient was a gentleman aged 50, who had suffered for five years from great inconvenience, due to the collection in and the subsequent regurgitation of food from the pouch: it was situated at the back of the œsophagus on a level with the cricoid cartilage. It was reached through an incision along the anterior margin of the left sterno-mastoid muscle; the great vessels were drawn outwards, and the thyroid gland turned forwards and inwards: the pouch was then easily exposed and freed from its connection: the opening into the œsophagus was closed by means of eight silk ligatures. The patient made a good recovery.

Presented by H. T. Butlin, Esq.

**1869c.** A Halfpenny which was partially swallowed by a child four years of age, and was removed from the Pharynx by means of curved forceps after having been firmly impacted there for eight days.

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## SERIES XVI.

# DISEASES OF THE PERITONEUM, OMENTUM, AND MESENTERY.

**1883a.** A Mass of Caseous Material found in the Peritoneal Cavity, and resulting from a previous localised peritonitis, probably of a tubercular origin.

The patient was a man aged 30, who died from intestinal obstruction caused by old adhesions between the coils of the ileum: a similar caseating nodule was found in the liver.

The constricted portion of intestine is preserved in Series xviii. No. 2017a.

See also *Male Surgical Register*, vol. ii. (1889), No. 2028, and *Surgical Post-Mortem Register*, 1889, p. 98.

**MULTIPLE SECONDARY CARCINOMA OF THE PERITONEUM.**

**1886d.** A Diaphragm to which portions of some of the Lower Ribs are still attached: the under surface is covered with great regularity by a number of rounded or nodulated sessile growths, varying in size from that of a pea to that of a broad bean: some few are slightly pedunculated. Other parts of the Peritoneum were affected, but to a less extent; there were a few nodules on the Falciform Ligament of the Liver. The pelvic organs were matted together by growths of a similar nature: under the microscope their structure is carcinomatous of the encephaloid

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type, showing large glandular cells imbedded in a scanty meshwork of fibrous tissue.

The patient was a girl aged 15. The seat of the primary disease was not detected, but it was probably in one or other of the pelvic viscera (see *Teratological Catalogue*, No. 3673c). A drawing of the diaphragm and liver when fresh is preserved in Series lvii. No. 201a, and microscopical sections are preserved in Series lv. No. 244a.

See *Medical Post-Mortem Register*, vol. xvii. p. 280.

## SERIES XVII.

## DISEASES AND INJURIES OF THE STOMACH.

**1931a.** A Stomach which has been laid open to show a large Malignant Ulcer situated on the posterior wall of the Greater Curvature: as a result of the subsequent inflammation the Stomach has become adherent to the adjacent portion of the Transverse Colon, into which a fistulous opening, caused by spreading of the ulceration, now leads. Near the Pylorus, but on the Gastric Mucous Membrane, is a small raised nodule, probably malignant in character.

See *Medical Post-Mortem Register*, vol. xvi. p. 29.

**1949d.** A Stomach, together with the last four inches of the Œsophagus, from a case of poisoning by Carbolic Acid. The Stomach has been laid open along its lesser curvature: it is seen that the whole of the Mucous Membrane of the Œsophagus and Stomach is thickly covered by a firm encrustation of a dirty yellow colour: when fresh, this was of an almost snowy white, and the contrast with the acutely inflamed Mucous Membrane, seen in a few places where the encrustation had been broken off, was most marked.

The patient was a young woman aged 22, who died three hours after taking the poison: her lips and the middle of the mouth were charred by the acid.

Drawings of the face and of the stomach when fresh are preserved in Series lvii. Nos. 174a and 224a.

See *Medical Post-Mortem Register*, vol. xviii. p. 194.

## SERIES XVIII.

## DISEASES AND INJURIES OF THE INTESTINES.

**1952a.** A Piece of the Small Intestine showing along the Mesenteric border two Pouches. The larger of the two is more or less globular, and measures about one inch in diameter: it protrudes between the layers of the Mesentery, which is slightly thickened over the Sac. The smaller Pouch, situated six inches from the larger, is pyriform in

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shape, and measures three-quarters of an inch in its long diameter. The remaining portion of the Intestine is normal in appearance, and shows no enlargement from distention.

From a woman aged 56, who died from cerebral hæmorrhage: she also had emphysema and chronic interstitial nephritis.
See *Medical Post-Mortem Register*, vol. xviii. p. 355.

**ILEO-COLOSTOMY FOR CARCINOMA OF THE CÆCUM.**

**2027c.** A Cæcum, together with the Ascending, Transverse, and Descending Colon and a portion of the Ileum. At the level of the Ileo-cæcal Valve the Cæcum is the seat of malignant disease, which has caused a stricture, for the relief of which the operation of Ileo-Colostomy has been performed, *i.e.*, the Ileum has been divided at a point situated a few inches from its termination at the Ileo-cæcal Valve; the distal opening has been closed, while the proximal opening has been implanted into the Sigmoid Flexure. This portion of the Bowel has been laid open, and portions of its walls removed, to show more clearly the method by means of india-rubber rings which has been employed to fix the two pieces of Intestine together.

The patient was a man aged 64: he survived the operation for a few hours only. At the autopsy it was found that no fæcal extravasation had occurred: there were extensive secondary deposits in the liver and mesenteric lymphatic glands.
See *Male Surgical Register*, vol. iii. (1891), No. 1459.

**2040e.** A Portion of the Small Intestine where, as the result of a severe injury, the peritoneal and muscular coats have been ruptured and have retracted. There is no tear in the mucous membrane, which forms a loop three inches in length, and now protrudes through the aperture in its outer covering.

**2040f.** A Part of the Sigmoid Flexure from the same case as the preceding specimen and showing a similar injury. In this case there is also a rent in the Mesentery, but the portion of Mucous Membrane left uncovered is much less, and only measures one and a half inches in length.

The patient was a child aged 2, who was run over in the street and brought to the Hospital, where he shortly afterwards died.
See *Surgical Post-Mortem Register* (1891), p. 93.

**OPERATIONS ON THE INTESTINES.**

**2040m.** The Adjacent Portions of Small Intestine united by means of Senn's Decalcified Bone Plates, from a case of Strangulated Umbilical Hernia necessitating resection of the Gangrenous Gut. At the open ends of the Intestine the Mucous Membrane has been invaginated and the peritoneal surfaces united by silk sutures. The plates were then introduced and the contiguous portions of Intestine sutured together. It is seen that the proximal end is still the larger, not having recovered from the distention caused by the obstruction.

Openings have been made in the walls of the Bowel to show the position of the plates.



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The patient was a woman aged 41, who had suffered from a hernia for 18 months. Symptoms of strangulation had existed for four days. She survived the operation seven hours. At the *post-mortem* examination it was found that the intestine had united. The sutures were deeply buried in newly-formed plastic lymph, and no extravasation had occurred.

The portion of gangrenous bowel removed at the time of operation is preserved in Series xx. No. 2109c.

See *Female Surgical Register*, vol. iii. (1891), No. 1718.

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## SERIES XIX.

# DISEASES OF THE RECTUM AND ANUS.

**ABSCESS IN THE WALLS OF THE RECTUM.**

**2055b.** A Rectum together with the Uterus of an old Woman. In the anterior wall of the Rectum, at about 4 inches from the Anus, situated just behind the Uterus, is an abscess cavity. Its sides are pressed together, and it measures nearly an inch in its longest diameter. Between the abscess and the Mucous Membrane of the Bowel the walls of the Rectum are much thickened, and the calibre of the Bowel is diminished, together giving the appearance of a malignant tumour. This part, however, is quite soft to the touch, and the microscope shows that the thickening is due to inflammation only, and not to Carcinoma or any other new growth.

Several Hæmorrhoids are present round the margin of the Anus.

The patient was aged 67 at the time of her death. She was also the subject of osteitis deformans. The bones affected were the right radius and right tibia. They are preserved in Series i. Nos. 74e and f.

See *Female Surgical Register*, vol. v. (1891), No. 2639*.

**MULTIPLE POLYPI OF THE RECTUM.**

**2065a-1.** Six Polypi removed by operation from the Rectum. The largest measures two inches in diameter, and is irregularly nodular on the surface. The smaller Polypi are of about the size of a filbert. Microscopically the structure is that of a simple Adenoid Polypus.

The patient was a boy aged 11, who had suffered from hæmorrhage for 4 years. See *Male Surgical Register*, vol. ii. (1890), No. 3177.

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## SERIES XX.

# HERNIÆ, OR PROTRUSIONS AND OTHER DISPLACEMENTS OF THE INTESTINAL CANAL AND OMENTUM.

**2082a.** The Sac of a Large Irreducible Femoral Hernia for which the operation of Radical Cure was performed. It had existed for many

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years, and its walls are so thick and contain so much fibrous tissue, that when removed the sac did not collapse, but retained its present shape.

The patient was an elderly woman. For further details see *Female Surgical Register*, vol. v. (1890), No. 1697.

**HYDROCELE OF THE SAC.**

2083a. The Sac of a Femoral Hernia removed in the course of an operation for Radical Cure. Owing to adhesions which had formed at the neck of the Sac, the Sac itself had become cut off from the general cavity of the Peritoneum, and had subsequently become distended with fluid, thus forming a so-called "Hydrocele of the Sac."

See *Female Surgical Register*, vol. iv. (1891), No. 441.

2109b. The Sac of a Right Inguinal Hernia with its Contents. Protruding through an operation wound at the neck of the Sac is a piece of Intestine which has been laid open, it is dark and in a gangrenous condition. The Hernia had long been irreducible, and the Intestine is adherent to the walls of the Sac.

The patient was a man aged 32, who had had a hernia for 10 years. At the operation the intestine in the sac was found gangrenous; the stricture was divided and a healthy piece pulled down, sutured to the sides of the wound and opened. He did not rally, but gradually sank, and died at the end of two days.

See *Male Surgical Register*, vol. iii. (1889), No. 3715.

2109c. The Contents of the Sac, together with the Ring which formed the constriction, in a case of Strangulated Umbilical Hernia. The Intestine is gangrenous and has been laid open; it, with the neck of the Sac and a portion of the Abdominal Wall, was resected at the time of operation, and the cut ends of the Intestine sutured together.

See Specimen, Series xviii. No. 2040m.

For notes of the case see *Female Surgical Register*, vol. iii. (1891), No. 1718.

**DOUBLE INTUSSUSCEPTION.**

2183a. A Cæcum, with a portion of the Ascending Colon, into which an Intussusception of the Ileum has occurred. Both the Colon and the Ileum have been laid open longitudinally, disclosing in the centre of the latter a Meckel's Diverticulum, which has itself been invaginated into the Ileum. The Diverticulum has been incised; the Mucous Membrane lining both it and the intussuscepted part of the Ileum is dark and discoloured from the acute inflammation which the tissues had undergone, producing a gangrenous condition with sloughing of the end of the Intussusceptum. A large black tube has been passed from the opening made in the Ileum, and protrudes at the proximal end of the same.

The patient was a labourer aged 42, whose history was as follows:—

On April 27, 1891, he was seized with severe abdominal pain, accompanied by vomiting. He was also constipated. Under treatment he recovered in a week and resumed work.

On May 18 the symptoms returned, but were not relieved by treatment. The vomiting soon ceased. Peritonitis set in, and he died on June 9th, about a fortnight after the onset of symptoms.

Presented by James Adams, M.D.

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**2191c.** An Intussusception of the Small Intestine which was removed by operation. The outer layer (Intussuscipiens) has been divided longitudinally and hangs below the intussuscepted part, one half of which only is shown. The inner layers are greatly congested and blood-stained, and are much thickened from recent acute inflammation. Above this is hung a small fibrous Polypus which shows some calcareous degeneration in its centre; it is covered by Mucous Membrane. This was attached to the Ileum at a spot about two feet distant from the Ileo-cæcal valve and immediately above the Intussusception.

The patient was a woman aged 30, who was admitted into the Hospital suffering from acute intestinal obstruction. Abdominal section was performed and the intussusception found. As it could not be reduced, the parts were resected, when the polypus was discovered and removed at the same time. She died two days later from peritonitis.

See *Female Surgical Register*, vol. ii. (1891), No. 2092.

## SERIES XXI.

## DISEASES AND INJURIES OF THE LIVER.

**PYLEPHLEBITIS.**

**2205a.** A Liver, the Portal Vein of which was found to be plugged by a firm partially decolorised clot. The whole gland is enlarged and weighed 65 ounces. The Lobulus Spigelii is enlarged to four or five times its normal size. The Gall-bladder is much thickened, and all the tissues in the Transverse Fissure are firmly matted together.

From a man aged 41, who was admitted into the Hospital and died the same evening.
See *Medical Post-Mortem Register*, vol. xvi. p. 108.
A drawing is preserved in Series lvii. No. 274b.

**2215a.** A Section through a Liver, very extensively diseased by Multiple Sarcomata. The whole gland was enormously but uniformly involved, and reached to the Umbilicus in the middle line. On section it was found to be filled with masses of soft yellowish material, nearly circular in shape, and varying in size from $\frac{1}{4}$ to 1 inch in diameter, and being so numerous as to leave very little Liver substance remaining. The Bile Ducts were pervious, and Bile was present in the Duodenum. The Portal Vein was normal. An enlarged Lymphatic Gland which had commenced to "break down" was found in the Hilum of the Liver; the lumbar Lymphatic Glands were also increased in size.

From a man aged 56. Under the microscope the tumours were found to be small round-celled Sarcomata.
See *Medical Post-Mortem Register*, vol. xvii. p. 142.

**2216c.** The Left Lobe and Part of the Right Lobe of a Liver showing several rounded masses which are the secondary deposits of Colloid Carcinoma. They occur on or near the surface. One of the masses situated on the under surface shows distinct umbilication. On section

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they are seen not to extend deeply into the Liver substance. The primary growth occurred at the cardiac end of the Stomach, and involved by direct extension the lower end of the Œsophagus. There was also some infiltration of the Suprarenal Capsules and of the neighbouring Lymphatic Glands.

The patient was a man aged 35.
See *Medical Post-Mortem Register*, vol. xvii. p. 301.

**2240a.** A Portion of the Right Lobe of a Liver showing on the anterior surface an irregular rent, over five inches in length, which is closed by a recent blood-clot.

From a young man aged 15, who, whilst riding a bicycle, was struck in the right side by the end of a shaft. He survived the injury four days, death arising from peritonitis caused by the escape of blood and bile. The laceration itself is closed and the repair nearly complete. Compare Specimen 2308b in Series xxv.
See further *Male Surgical Register*, vol. ii. (1891), No. 1087.

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## SERIES XXII.

## DISEASES AND INJURIES OF THE GALL-BLADDER AND BILIARY DUCTS.

**2263a.** A greatly Thickened and Ulcerated Gall Bladder. Its internal surface is in many places thickly covered with a fine, mud-like, dark brown deposit of Cholesterin, though no distinct Gall-Stones are present. Near the fundus are numerous small circular ulcers, the size of a split pea or rather less; one of these, larger and deeper than the others, had perforated the walls and caused acute and fatal peritonitis.

From a man aged 67. See *Medical Post-Mortem Register*, vol. xvii. p. 285b.

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## SERIES XXIV.

## DISEASES OF THE LYMPHATIC GLANDS AND VESSELS.

**2284a.** A Chain of Lymphatic Glands, enlarged from the deposit of Tubercle secondary to disease of the Hip-Joint.

The lower portion, to which the left Common Iliac Artery is attached, was situated round the brim of the Pelvis, and led from the suppurating Hip-Joint: the upper part of the specimen lay along the left side of the Aorta, and extended as high as the Diaphragm. They were very firm and gritty when cut. There was no enlargement on the right side either of the Pelvic or Abdominal Glands.

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The hip-joint from the same case is preserved in Series ii. No. 570c, to which refer for the history of the case.
See also *Female Surgical Register*, vol. iv. (1890), No. 143.

**2291a.** A Mass of Abdominal Lymphatic Glands very much enlarged from a secondary deposit of Carcinoma. They were situated in front of the Upper Sacral and Lower Lumbar Vertebræ, and have surrounded and partially displaced the bifurcation of the Aorta and commencement of the Inferior Vena Cava. The primary disease occurred in the Prostate Gland, microscopical examination of which and of this specimen showed the typical structure of Scirrhous Carcinoma.

See *Male Surgical Register*, vol. v. (1891), No. 451.
Microscopical sections of the prostate are preserved in Series lv. No. 565a.

## SERIES XXV.

## DISEASES AND INJURIES OF THE SPLEEN.

**2298c.** A Portion of a Spleen which has undergone Amyloid Degeneration. The cut surface shows very well the appearances due to this disease. The specimen was prepared by hardening in strong alcohol.

From a man aged 44, who died from exhaustion due to prolonged suppurative disease, the liver and kidneys were also affected.
See *Male Surgical Register*, vol. i. (1890), No. 313z.

## SERIES XXVI.

## DISEASES OF THE THYMUS AND THYROID GLANDS.

**SARCOMA OF THE THYROID GLAND.**

**2318c.** The Larynx, Trachea, and Great Vessels of the Neck. On the right side the region of the Thyroid Gland is occupied by a large Tumour, which has become adherent to and has directly involved the Skin, the Right Clavicle, upper part of the Sternum, and surrounding structures. The Sterno-Mastoid Muscle is thinned out over the Tumour, and is adherent to and implicated by the growth, as also are the Internal Jugular Vein and Carotid Artery of that side. The Tumour has been laid open from the front, and its interior is seen to be soft and shreddy and deeply blood-stained. Microscopical examination showed its structure to be a Myxo-Sarcoma.

Both the Œsophagus and Trachea are displaced towards the left, and although the walls of both are involved, in neither is the Mucous Membrane ulcerated.

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The patient was a gentleman aged 68. Up to nine weeks before his death he had always enjoyed good health: at this date he first noticed a slight swelling on the right side of his neck: a fortnight later he first consulted a medical man for neuralgia running up the side of his neck and head: there was then a firm and tender swelling occupying the position of the right half of the thyroid gland: it was fixed to the larynx, and increased very rapidly: a fortnight later dysphagia set in with paralysis of the vocal cord of the right side. All the symptoms increased with very great rapidity, and he died nine weeks after the swelling was first noticed from exhaustion and pneumonia due to secondary deposits in the lung.

A portion of the left lung, showing numerous secondary deposits, is preserved in Series xi. No. 1740a, and microscopical sections of the tumour in Series lv. No. 359.

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## SERIES XXVIII.

# DISEASES AND INJURIES OF THE KIDNEYS, THEIR PELVES, AND THE URETERS.

### SPECIMENS ILLUSTRATING THE REMOTER EFFECTS OF RENAL CALCULUS.

**2351a.** The lower specimen is a Left Kidney containing several Calculi. Though not much enlarged, it is greatly disorganised, and, owing to the long-continued irritation and inflammation, is surrounded by dense fibrous tissue, which has firmly united it to the neighbouring structures. A light green glass rod has been placed in a Sinus where a Calculus has ulcerated through into the Descending Colon.

The upper specimen is a portion of the Lower Lobe of the Left Lung firmly united to the Diaphragm, which again was adherent to the Kidney. A blue glass rod shows where a Sinus, also caused by a Calculus, led through the Diaphragm into the substance of the Lung, there causing the formation of an Abscess which proved fatal.

Since each Sinus led into the Pelvis of the Kidney, there was a direct communication from the Abscess in the Lung through the Diaphragm and Kidney into the Descending Colon.

A drawing of the parts when fresh is presented in Series lvii. No. 324c.
For notes of the case see *Male Surgical Register*, vol. v. (1890), No. 3520.

**2368a.** The Urinary Bladder, Ureters, and Kidneys in which there are two Ureters on each side. The Bladder is slightly more capacious than usual, but its walls are not thickened. On both sides the orifice of the more posterior Ureter shows some pouching between the Mucous Membrane and the Muscular Coats.

On the left side both Ureters, particularly the more posterior, are much increased in size, and the Pelvis of the Kidney is greatly dilated, causing absorption and loss of Kidney substance. A similar condition is present, though to a less extent, on the right side, except that the calibre of the anterior Ureter is hardly increased beyond the normal.

From a man aged 50, who died from cerebral hæmorrhage.
See *Medical Post-Mortem Register*, vol. xvii. p. 2.

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**HYDRONEPHROSIS.**

**2375a.** A Right Kidney removed by operation. The Pelvis is very much distended and now forms a large Sac; very little Kidney substance remains. The Ureter, into which a blue glass rod has been inserted, is at the lowest part of the Sac, and communicates with it by a more or less valvular opening. Its calibre is not enlarged.

The patient was a woman aged 43, who had suffered from pain in the region of the kidney for three years. No stone was found, and the only cause suggested was abnormal arrangement of the arteries. The woman made a good recovery, and was quite well one year after the operation.

See *Transactions of the Pathological Society*, vol. xlii. p. 185.

Presented by Alban Doran, Esq.

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## SERIES XXX.

# DISEASES AND INJURIES OF THE BRAIN AND ITS MEMBRANES.

**2456a.** The Dura Mater covering the upper part of the Brain. The under surface of the right side is much thickened by numerous flat nodulated growths, some of which are attached by a thin pedicle only. It is evident that the greater number of these lie beneath the Arachnoid. They are probably due to syphilitic inflammation of the Dura Mater. A large mass, which was more loosely connected than the rest, and became detached during the removal of the Cranium, is hung above the specimen already described; it also occurred on the right side.

From a man aged 36, who died in Wandsworth Lunatic Asylum. He had been an inmate of various asylums for the last eight years of his life.

Microscopical sections of the tumour are preserved in Series lv. No. 419a.

Presented by A. M. Jackson, M.D.

**2459a.** The upper part of the Dura Mater, on the cerebral surface of which are several irregular growths composed of hard bony substance. They are not symmetrical, those on the right side being situated over the frontal and parietal regions, that on the left side mostly over the occipital region. There is also a hard spicule on the right side of the posterior part of the Falx Cerebri.

From the Dissecting-Room.

**2465b.** The portion of the Right Parietal Bone to which the Fibroma of the Dura Mater (see preceding specimen, No. 2465a) was attached. The whole bone is thick, and there is on the inner surface a flattened irregular Exostosis, the base of which is deeply grooved by nutrient arteries; at this point the Dura Mater was adherent, but not firmly so.

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**INTRACYSTIC SARCOMA OF BRAIN.**

**2500a.** The specimen consists of a portion of the Right Hemisphere: situated in the posterior part is a well-marked flattened Cyst, measuring two inches in diameter and containing a soft flocculent growth: under the microscope this was found to be a Sarcoma of a very vascular nature; the rest of the Cyst contained a pale yellow fluid; the specimen was hardened in Müller's solution.

The patient was a man aged 42. For further details see *Medical Post-Mortem Register*, vol. xvii. p. 112.

**PSAMMOMA OF PONS VAROLII.**

**2501b.** The Right Half of the Pons Varolii and Cerebellum, which have been cut through longitudinally. The whole of the Pons is much enlarged, measuring two inches from before backwards, and has on section an uniform white appearance; it projects backwards into the fourth ventricle; the anterior surface is irregular and slightly lobulated. Under the microscope its structure is that of a Psammoma.

See *Medical Post-Mortem Register*, vol. xviii. p. 57.
Microscopical sections are preserved in Series lv. No. 451a.

## SERIES XXXII.

# DISEASES AND INJURIES OF NERVES.

**SARCOMA OF THE PERONEAL NERVE.**

**2561a.** A Section through the Upper Half of the Left Fibula and of a Sarcoma arising in the Peroneal Nerve. The Tumour, though closely adherent to the Bone, is separated from it by the Periosteum, while the Nerve which is seen at the upper and back part of the specimen, is intimately blended with the tumour.

From a boy aged 12. The operation was performed at the Royal Free Hospital in December 1889: there was no glandular enlargement, and the boy made a good recovery except for a kind of talipes consequent on paralysis of the muscles supplied by the affected nerve. In April 1891 he began to feel pain in his loins and legs: he was readmitted, and in May 1891 laminectomy was performed for the relief of pain caused by a secondary growth: this was found to be growing from the body of the first lumbar vertebra, and could not be removed. The boy lived for more than a year, but gradually got weaker, and died in April 1892.

Presented by James Berry, Esq.

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## SERIES XXXV.

# DISEASES AND INJURIES OF THE SKIN AND ITS APPENDAGES.

**2702c.** Two Epithelial Casts which were shed from the Heels of a Patient recovering from an obscure form of Skin Disease.

See *Matthew Ward Note-Book, sub* C. Howard, 1891, No. 166.

**2708b.** Two Small Compound Papillomata which grew on the front Abdominal Wall. They were removed by operation.

The patient was an elderly man, who also suffered from symptoms of papilloma of the bladder.

Presented by Guy Stephen, Esq.

**ANTHRAX.**

**2734d.** A Malignant Pustule which was excised from the Forearm.

The patient was a man aged 41, who worked at loading and unloading hides. He had noticed a small pimple for a few days. This increased in size, and he was admitted into the Hospital and the growth was freely removed with the knife. Both the blood and the serous secretion from the neighbourhood contained large quantities of typical anthrax bacilli, of which microscopical specimens are preserved in Series lv. Nos. 836, 837 and 838. He made a good recovery.

See *Male Surgical Register*, vol. i. (1891), No. 1426.

## SERIES XXXVI.

# DISEASES OF THE TESTICLE.

**TUBERCULAR TESTIS.**

**2774a.** The Left Half of a Testis with the surrounding structures. The section shows that the Body of the Testis is adherent to and partly protruding from the Skin of the Scrotum; the larger mass behind, which is largely composed of fibrous tissue and contains a caseating mass at its posterior and lower part, is the altered and greatly enlarged Epididymis. Above this the constituents of the Cord are all enlarged; the Vessels and Lymphatics form one mass in front, while the greatly thickened Vas Deferens lies behind. In connection with this is an old abscess cavity, measuring nearly two inches in its long diameter. This has been laid open, displaying caseous material in its interior.

The patient was a man aged 29, who had suffered from an enlarged testis for one year. It was removed by operation.

See *Male Surgical Register*, vol. iii. (1890), No. 1984.

**2774b.** A Testis which has been laid open. The section shows that the greater part of the Body has been converted into a dense fibrous mass,

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imbedded in which are six small nodules composed of caseous matter. At one part the Skin has become adherent, and from this a small abscess has been evacuated. Seen from behind, it is noticed that both the Epididymis and Cord are considerably thickened.

Presented by John Langton, Esq.

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## SERIES XXXVII.

# DISEASES OF THE SCROTUM.

**2819b.** A Congenital Multilocular Cystic Tumour of the Scrotum. The Tumour has been laid open longitudinally after having been hardened in alcohol, and is seen to be composed of a number of cysts, varying in size from that of a large hazel-nut to that of a small pea, which are more or less filled by a homogeneous material. When fresh the cysts were quite soft and translucent. The Testis was not affected, although it lay in close contact with the Tumour, which was noticed shortly after birth, and had slowly increased. It occurred on the left side.

From a boy aged 9.
See *Male Surgical Register*, vol. ii. (1891), No. 749.

**2819c.** A Congenital Multilocular Cystic Tumour of the Scrotum, very similar to the preceding specimen. It has been laid open by a longitudinal incision, and is composed of a number of small cysts of various sizes, which are partially filled by a homogeneous substance. In places this is blood-stained. There is rather more fibrous tissue than in the preceding specimen. In this case, also, the Testis, although closely connected, was not affected. It had slowly increased since birth, and occurred on the right side.

From a boy aged 11.
See *Male Surgical Register*, vol. v. (1892), No. 247.

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## SERIES XL.

# DISEASES AND INJURIES OF THE URETHRA AND PENIS.

**2902k.** A Small Bony Plate which was removed by operation from the Dorsum of the Penis.

The patient was an elderly gentleman, who could give no cause from injury or previous inflammation for the origin of the specimen.

Presented by H. T. Butlin, Esq.

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## SERIES XLI.

# DISEASES OF THE OVARIES.

**2904f.** An Ovary in an early stage of Cystic Degeneration. A portion of the Cyst wall has been removed, showing that the whole Gland has been transformed into a unilocular Cyst of about the size and shape of a turkey's egg.

**2904g.** An Ovary removed by operation, showing an early stage of Cystic Disease. There are four small Cysts, the largest of which is about the size of a walnut.

The Fallopian Tube, which is still attached to the Ovary, is a good deal enlarged in places.

**2908e.** An Ovary showing a Corpus Luteum into which Hæmorrhage has occurred. It was removed by operation, together with a large Parovarian Cyst of the Broad Ligament.

**2912a.** A Large Proliferating Cyst of the Ovary removed by operation. The Cyst has been turned inside out. On its walls are a number of small Cysts containing clear fluid. There are also numerous bands of fibrous tissue attached to the walls and spreading from one point to another.

See *Martha Ward Book* for 1890.

### DERMOID CYSTS OF THE OVARIES.

**2915b.** A Portion of a Dermoid Cyst of the Left Ovary, measuring five inches in its long diameter. It has been laid open, and the semi-fluid contents have been removed. Attached to the anterior wall of the interior of the Sac are three smaller Cysts, and lying among them are two well-formed Teeth.

The distal end of the Fallopian Tube is attached to the upper part of the Cyst. Several of the Fimbriæ have small cysts at their free extremities.

From a young lady aged 18. Abdominal enlargement had existed for three years, increasing rapidly during the three months previous to operation. The right ovary, which also contained a dermoid cyst, was removed with a large parovarian cyst at the same operation. It is preserved in Series xlii., No. 2942c.

Presented by F. H. Champneys, M.D., and W. A. Meredith, Esq.

**2915c.** An Uterus with its Appendages. On each side the substance of the Ovary is replaced by a Cyst measuring almost three inches in diameter. Portions of the cyst-walls have been cut away, and the contents, which consisted of thick sebaceous material mixed with Hairs, have been removed. Some of this material with a few Hairs still remains adherent to the interior of the Cysts.

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**2930c.** An Uterus with its Appendages. The Right Fallopian Tube, Ovary, and Broad Ligament show no abnormality or sign of disease. On the left side are seen the changes consequent on removal of a large cystic tumour of the left Ovary eight years before death. The Pedicle, which lies immediately above a small red glass rod, is reduced to a small nodule of tissue about half an inch long. The groove formed by the ligature shows plainly. No trace of the ligature could be found after death. The Sigmoid Flexure is closely attached to the Uterus, as its Mesentery originally formed part of the Ovarian Pedicle; its calibre is slightly increased above the point of attachment.

From a woman aged 40. In 1883 the tumour was removed by Mr. Alban Doran. It was a large multilocular cyst with solid contents. The pedicle was very broad, involving externally the sigmoid mesocolon, so that the sigmoid flexure was closely attached to the tumour. The patient recovered, but in 1890 she began to suffer from tubercular pyelitis. An exploratory operation was made, but the removal of the kidney was found impracticable. She died of phthisis in July 1891 in the Hospital. No obstruction of the left ureter in the pelvis or elsewhere could be detected.

See *Medical Post-Mortem Register*, vol. xviii. p. 210.

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## SERIES XLII.

## DISEASES OF THE UTERINE APPENDAGES.

**2942c.** A Large Parovarian Cyst of the Right Side, situated between the layers of the Broad Ligament, and measuring six inches in its long diameter. Its walls are rather thicker than usual. The Fallopian Tube is elongated and extends along the top of the Cyst, which has been laid open. The Ovary is the seat of a Dermoid Cyst, and contains hairs and sebaceous material.

The left ovary also contained a dermoid cyst and was removed at the same operation. See No. 2915b of this Series.

Presented by F. H. Champneys, M.D., and W. A. Meredith, Esq.

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## SERIES XLIII.

## DISEASES OF THE UTERUS.

### PROLAPSE OF DOUGLAS' POUCH.

**2947a.** The Left Half of the Female Pelvic Organs, which have been cut through longitudinally. The Uterus is enlarged and greatly elongated, as also is the Cervix: the External Os, together with the posterior vaginal wall, are prolapsed and protrude from between the Labia. The peritoneal lining of Douglas' Pouch is thickened and covered with a layer of lymph and pus: the Cervix Uteri and especially the Bladder are flattened from before backwards, owing to the pressure of the fluid

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which collected in the space behind them. The left Fallopian Tube is also greatly distended and contained pus (pyo-salpinx). A portion of the Rectum cut through longitudinally can be seen at the back of the specimen.

From a woman aged 37, who died of "cancer of the peritoneum." For some months before her death, fluid limited above by adhesions, had accumulated in the pelvis, for which she was tapped on several occasions; after each tapping the prolapse disappeared, and did not trouble her until another accumulation caused difficulty in micturition and partial retention of urine.

Presented by Joseph Griffiths, Esq.

**3016a.** The Urino-Generative Organs of a Female Infant aged seven weeks. The large fibrous Sac, which has been divided by a mesial section, is the Vagina: it has been enormously distended by puriform fluid owing to an imperforate Hymen: the Uterus, the cavity of which is also distended, and the walls of which are quite thin, is situated at the upper part of the distended Vagina: the Bladder is enlarged, and has been completely drawn out of the Pelvis, thereby causing great elongation of the Urethra: the pressure has also acted on the Ureters, causing obstruction to the flow of urine in them, with subsequent distension both of their walls and also of the calyces of both Kidneys.

The child was admitted on account of a soft fluctuating swelling presenting at the vulva (see drawing No. 517b), which was thought to be possibly a vaginal hernia: the child became very ill and died: it was then found that the swelling was due to a distended imperforate hymen, and that the vagina contained pus.

Drawings are preserved in Series lvii. Nos. 517b and c.

See also *Female Surgical Register*, vol. iii. (1892), No. 488.

Presented by W. McAdam Eccles, Esq.

## SERIES XLV.

# DISEASES OF THE OVUM AND ITS MEMBRANES.

**EARLY ABORTION (Third Month).**

**3056a.** The whole mass is oval in shape, it has been cut through longitudinally, and consists of two easily distinguishable portions, viz.—

($\alpha$) The developing Placenta and shrunken Amniotic Sac, in which no Embryo could be found: this is situated at the lower part of the specimen.

($\beta$) The Decidual Cavity, greatly distended with blood: this is closed, preventing the escape of the effused blood.

From the shape of the specimen it appears probable that, if abortion had not taken place, the Placenta would have been prævia.

From a healthy woman aged 30, who had borne two children; this was the first miscarriage.

A drawing of the specimen when fresh is preserved in Series lvii. No. 519c.

Presented by W. S. A. Griffith, M.D.

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## SERIES XLVII.

# DISEASES AND INJURIES INCIDENTAL TO GESTATION AND PARTURITION.

**3094b.** The Uterus and surrounding structures of a Woman who died from Septicæmia after childbirth. The Uterus, which has been laid open posteriorly, measures with the Cervix four inches in length. When fresh, the body appeared spongy, and pus could be squeezed out of several of the Sinuses. The Endometrium is flocculent and suppurating, the Cervix is normal, and the left Ovary and Tube show no inflammatory changes. On the right side the Ovary and the blood-vessels supplying it are suppurating, and all the venous channels, from the Uterus to the Vena Cava Inferior, are indurated and thickened as if thrombosed; on section it is seen that this is due to inflammation of the walls of the vessels. The Right Common Iliac of Vein has been preserved, and contains a channelled coagulum, the end of which protrudes into the Vena Cava.

From a primipara whose mother and sister both suffered from phlegmasia dolens, who was delivered without assistance in Queen Charlotte's Hospital. Septic symptoms occurred early, but were not severe until the eleventh day. She died on the twenty-sixth day.

Presented by W. S. A. Griffith, M.D.

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## SERIES XLVIII.

# DISEASES OF THE MAMMARY GLAND.

### MYXO-SARCOMA OF THE MAMMA.

**3162a.** A Portion of a Mammary Gland. Immediately below the Nipple, which is much retracted, there is a Tumour, affecting the greater part of the Gland, and composed of a series of Cysts with tough fibrous walls, which are mostly filled by irregular pedunculated growths. On microscopical examination these were found to be myxo-sarcomatous in character, and to contain no gland tissue.

See *Female Surgical Register*, vol. ii. (1890), No. 2076.
Microscopical sections of the tumour are preserved in Series lv. No. 648a.

**3179a.** A Scirrhous Carcinoma of the Mammary Gland, which has ulcerated through the Skin, and now forms a large Fungating Tumour. The mass is flattened, nearly circular in shape, and measures five inches across its longest diameter. Before removal it was diagnosed as a Sarcoma

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from its general appearance, but subsequent microscopical examination showed that the structure was that of a Scirrhous Carcinoma.

The patient was a woman aged 67. The tumour had grown very rapidly, and had reached its present size in nine months. One gland in the axilla had become infiltrated, and was removed at the same time.

A drawing of the tumour before removal is preserved in Series lvii. No. 527c.

See *Female Surgical Register*, vol. iv. (1891), No. 918.

**HÆMORRHAGIC CARCINOMA OF BREAST.**

3184a. One Half of a Mammary Gland removed on account of Scirrhous Carcinoma. The part affected, situated immediately beneath the Nipple, is unusually well defined, and is separated from the surrounding tissue of the Breast by a fibrous capsule. It is still of a much darker hue than the healthy gland, and when fresh was of a deep claret colour, due to the presence of a large quantity of blood. Microscopical examination showed its structure to be that of Scirrhous Carcinoma, into the fibrous tissue of which a great deal of blood had been effused.

The patient was a woman aged 54, who had noticed a lump in her breast for five weeks only, but had suffered pain there for eight weeks in all. She was married, but had not borne children.

A microscopical section of the tumour is preserved in Series lv. No. 659a.

A drawing of the appearances when fresh is preserved in Series lvii. No. 528b.

See *Female Surgical Register*, vol. ii. (1891), No. 1066.

3185e. A Portion of a Mammary Gland, the seat of Scirrhous Carcinoma, showing two small areas of Colloid Degeneration. On the cut surface there are also seen numerous dilated Ducts, some of which still contain caseous material. The Nipple is much retracted.

The patient was a woman aged 56, who on admission was found to be suffering from tumours of both mammary glands, with a history of six months' duration. Both breasts were removed, and both were carcinomatous; one showed the simple encephaloid variety, the other colloid degeneration.

See *Female Surgical Register*, vol. i. (1891), No. 80.

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## SERIES L.

## GENERAL PATHOLOGY.

**SPURIOUS ELEPHANTIASIS.**

3216d. A Foot and Lower Part of the Leg, where, as the result of a large chronic Ulcer, situated just above the Ankle, and which has almost invaded the circumference of the Limb, complete Lymphatic Obstruction has supervened. As a result, the whole Foot is immensely increased in size, owing to the very extensive deposit of fibrous tissue in the deeper layers of the Skin. The Ulcer is now healed, but the scar is of large size, and there has apparently been much loss of substance during the

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prolonged suppuration. The whole of the affected Skin is considerably pigmented.

The patient was a man aged 64, who had suffered from the ulcer for 16 years. As the limb was quite useless, it was amputated.

See *Male Surgical Register*, vol. iv. (1891) No. 1449.

**INJURY.**

**3238k.** The Right Carpus of an Adult, removed by amputation through the Wrist-Joint on account of a severe compound comminuted Fracture of the Metacarpal Bones, caused by the Hand having been caught in the cog-wheels of machinery in motion. The ends of the first and third metacarpal Bones, together with the deep Flexor Tendons, lie exposed in the wound, while the Muscles and surrounding Skin are discoloured from the dirt and oil introduced at the time of the accident.

**3250a.** A Portion of a Large Fatty Tumour removed from the front of the Thigh. At the time of the operation it was found that the Tumour was not encapsuled, but had infiltrated the Muscles, and had grown in and among the bundles of muscular tissue. This is clearly seen in the cut surface of the specimen, where long thin strips of Muscle occur, separated from each other by Fat.

A drawing of the tumour when fresh is preserved in Series lvii. No. 550a.

See *Male Surgical Register*, vol. iii. (1890) No. 1284.

**3339a.** One Half of a Small Tumour removed by operation from the Umbilicus. Microscopical examination proved it to be a Colloid Carcinoma.

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## SERIES LII.

## URINARY CALCULI.

**41a.** Six Calculi removed by Supra-pubic Cystotomy. They all have flattened surfaces and are of a more or less pyramidal shape. The largest Calculus has been cut in two, and is seen to have a dark-coloured nucleus of Uric Acid, while the remainder is composed of a pale outer covering of earthy Phosphates.

The patient was an old man aged 61, who had suffered from symptoms of stone in the bladder for twenty years.

See *Male Surgical Register*, vol. v. (1892) No. 388.

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## SERIES LIII.

## CALCULI AND OTHER CONCRETIONS FORMED IN THE DIGESTIVE ORGANS.

**287a.** A Hair Ball removed from the Stomach of a Calf.

Presented by E. R. Evans, Esq..



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## SERIES LV.

## PATHOLOGICAL MICROSCOPIC SPECIMENS.

**70a.** Sections of a Multilocular Cystic Tumour of the Upper Jaw. Spreading from an ulcerated surface, there are seen a number of branching and communicating processes. These resemble the Acini of a racemose Gland, and consist of hollow tubes or ducts lined by spheroidal Epithelium, which grow out into and invade the surrounding structures. The Tumour is a Carcinoma.

See *Male Surgical Register*, vol. iv. (1891), No. 1009.

**PERICARDITIS.**

**110a.** Section of a Portion of the Pericardium in a condition of Acute Inflammation. The Pericardium itself contains numerous Leucocytes among the bundles of fibrous tissue. Its inner surface is lined by a thick layer of coagulated Fibrin, which also contains large numbers of Inflammatory Cells.

**178a.** Section of a Lung in which there is a Secondary Deposit of Scirrhous Carcinoma.

**217a.** Section of an Epulis removed from the Alveolar Border of the Upper Jaw. It consists mainly of fibrous tissue with some spindle-shaped Cells and a number of Leucocytes. The free-surface is covered with squamous Epithelium. It contains no myeloid Cells.

**318a.** Section of a Liver secondarily infiltrated with Scirrhous Carcinoma. The primary growth occurred in the Mammary Glands, both of which were affected, and of which sections are preserved in No. 660a of this Series.

The Liver also showed considerable Fatty Degeneration.

See *Medical Post-Mortem Register*, vol. xix. p. 93.

**336a.** Section of a Lymphatic Gland secondarily affected with Melanotic Sarcoma. There is a considerable deposit of pigment within the cells. The primary disease occurred in the Skin.

**344a.** A Section of one of the Axillary Lymphatic Glands, from a case of Duct Papilloma of the Breast.

A section of the primary growth is preserved in No. 676a of this Series.

**348.** Section through an Infarct of the Spleen. It consists of "indifferent" tissue, the remains of old Blood-Clot, lying amongst which are numerous orange-coloured Crystals derived from the disorganised Blood-Corpuscles.

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**350.** Section of a Portion of a Tubercular Spleen. There are numerous collections of small-celled inflammatory material, in the centre of which a blood-vessel is generally situated. Elsewhere caseation of these "tubercles" has commenced.

**419a.** Section of a Gumma of the Dura Mater.

The tumour is preserved in Series xxx. No. 2456a.

**451a.** Section of a Psammoma involving the Pons Varolii. It consists of a Matrix which stains feebly, and contains numerous small nucleated Sarcoma Cells. Scattered irregularly through these are a number of large amorphous bodies, mostly circular in shape, and which are probably calcareous in character.

See *Medical Post-Mortem Register*, vol. xviii. p. 57.
The tumour is preserved in Series xxx. No. 2501a.

**458a.** Section of the Spinal Cord of a Child aged three months, who died from Acute Meningitis following the injection of the Sac of a Spina Bifida with Morton's Fluid. The interval between the Cord and its Sheath is occupied by leucocytes and inflammatory material.

The section was prepared by J. Cropper, Esq.

**479a.** A Portion of the Left Pneumogastric Nerve (above the origin of the Recurrent Laryngeal) from a fatal case of Beri-beri. The nerve-fibrils have been teased out and stained with osmic acid.

Presented by W. G. Ellis, Esq., of Singapore.

**555.** Section of a Multilocular Cystic Tumour removed from the Scrotum. The Cysts, which contained clear fluid, have a very fine lining membrane. The solid parts are composed mostly of fibrous tissue with some unstriped muscular fibres.

The tumour is preserved in Series xxxvii. No. 2819b, to which refer.

**555a.** Section of Tumour of the Scrotum similar to the preceding specimen (No. 555).

The tumour is preserved in Series xxxvii. No. 2819c.

**567a.** Section through a Primary Syphilitic Sore of the Penis. The Epithelium is eroded over the Ulcer, and the deeper structures show a very considerable amount of inflammatory small-celled infiltration.

**576a.** Section of a Papillary Growth which covered a large portion of the Interior of an Ovarian Cyst. It consists of fine branching Trabeculæ of fibrous tissue, which support a layer of columnar Epithelium. The greater part of the Cyst contained colloid material.

**594.** Section of the lining Mucous Membrane of the Uterus. The long and tortuous Ducts of the uterine Glands, lined by long ciliated Epithelium, are well seen; they are surrounded by inflammatory cells, among which a good deal of blood has been effused.

The specimen was removed, for persistent hæmorrhage, by means of the curette.

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**648a.** A Section through a Portion of one of the Intra-cystic Growths from a case of "Sero-Cystic" disease of the Mammary Gland. The solid parts show myxomatous tissue, while the free surface of the projecting Growths are covered by long columnar Cells.

**659a.** Section of a Portion of a Scirrhous Carcinoma of the Breast, into the substance of which very extensive Hæmorrhage had occurred. The Blood Corpuscles, some of which have crystallised, are entirely confined to the fibrous tissue part of the Tumour, and are not found among the glandular epithelial Cells.

The tumour is preserved in Series xlviii. No. 3184a, and a drawing of the specimen when fresh in Series lvii. No. 528b.

See also *Female Surgical Register*, vol. ii. (1891), No. 1066.

**660a.** Section of a Scirrhous Carcinoma of the Mammary Gland. Both Breasts were affected, and there was a diffuse general infiltration of the Liver, a section of which is preserved in No. 318a of this Series.

See *Medical Post-Mortem Register*, vol. xix. p. 93.

**676a.** Section of a Duct Carcinoma of the Breast. There is a large amount of fibrous tissue, in which are placed collections of small Cysts lined by large glandular epithelial Cells; the Cysts appear to communicate with others forming the same group, and from their walls numerous small processes composed of similar large cells and forming a kind of fringe project into the interior of the Cyst.

A section of one of the axillary lymphatic glands removed at the same time is preserved in No. 344a of this Series.

For notes of the case see *Female Surgical Register*, vol. iii. (1891), No. 1991.

**738a.** Section of Tumour removed by operation from the Scalp: its structure is for the most part that of a Round-Celled Sarcoma, interspersed here and there with irregular connective-tissue cells, and in places with bands of fibrous tissue.

The tumour is preserved in Series l. No. 3302a; there is also a wax model of the head in Series lvi. No. 212b, to which refer for details of the case.

**765a.** Section of a Tumour removed by operation from the front of the Upper Arm. It consists very largely of fibrous tissue, but at places there are distinct Lacunæ containing spheroidal cells, showing that it is a Carcinoma: its origin was probably in the Sebaceous Glands of the Skin.

See *Male Surgical Register*, vol. ii. (1891), No. 2666.

**819.** Section of a Portion of the Liver of a Rabbit, in which there is a small collection of Psorosperms: these, which appear as small oval clear bodies without a nucleus or any definite structure, are surrounded by a layer of fibrous tissue in the substance of the Liver. To the naked eye each mass or collection is just visible as a small white spot.

**838a.** A Specimen showing the Bacilli Anthracis, obtained from the Serum of one of the Vesicles surrounding a Malignant Pustule which occurred on the Forearm of a Man. The Bacilli have assumed the leptothrix form and are arranged in long and twisted threads.

See *Male Surgical Register*, vol. i. (1891), No. 1426.

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## SERIES LVI.

# CASTS AND MODELS OF DISEASED AND INJURED PARTS.

**40a.** Cast of the Right Side of a Man's Chest, showing a dislocation of the Shoulder-Joint.

**41c.** Cast of the Left Elbow of a Man aged 21, who had sustained a dislocation of the Radius two years previously. The Head of the Radius is extremely prominent and is covered by Skin only: there was free rotation.

**57a.** Cast of a Left Foot, in which the Internal Cuneiform Bone has been dislocated upwards, so that the Anterior Articular Surface lies immediately beneath the Skin.

See *Surgical Post-Mortem Register* (1892), p. 71.

**66e.** Casts of the Hands of the same Patient as that from which Cast No. 83a in this Series was taken. The Hands are everted towards the Ulna, so that the Carpus is at a right angle with the Bones of the Forearm.

See *Male Surgical Register*, vol. ii. (1892), No. 1178.

**69d.** Cast of the Front of a Man's Chest showing two Swellings, one in the left Mammary Gland and the other immediately above it. They both fluctuated, and an incision showed that they contained Pus.

See *Male Surgical Register*, vol. ii. (1892), No. 1136.

**73b.** Cast of the Right Upper Extremity of a Girl aged eleven, showing in a marked degree the results of old Infantile Paralysis. All the Muscles of the Arm, including the Deltoid, were completely paralysed, and beyond slight movement of some of the Fingers she had no power of movement in the Limb.

When 1½ years old she was struck by a falling door, after which loss of power in the right arm was noticed. She was treated by bandaging at a Hospital for four weeks, at the end of which time wasting of the arm was noticed.
See *Report Book of the Electrical Department*, vol. xi. p. 180, and vol. xv. p. 74.

**73c.** Cast of the Left Hand and Forearm of the Patient from which the preceding Cast was taken.

**78a.** Cast of the Right Foot of a Child showing a marked condition of Talipes Equino-Varus.

See *Male Surgical Register*, vol. iii. (1892), No. 430.

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**83a.** Cast of the Lower Part of the Trunk, Legs, and Feet of a Boy who had Talipes Equino-Varus, with very great Inversion of the Toes.

See *Male Surgical Register*, vol. ii. (1892), No. 1178.
The hands were also greatly deformed. See No. 66c in this Series.

**83b.** Cast of the Left Foot of the same Patient as the preceding cast, taken two months subsequently, and after the Astralagus had been excised for the cure of the deformity.

**84a.** Casts of the Hands of a Young Lady aged fifteen. The left Thumb is hypertrophied and is considerably larger than the right. The increase in size was first noticed during infancy.

**97c.** Casts of the Feet of a Child in a Condition of Talipes Calcaneus.

**97d.** Cast of the Left Foot of a Child showing Congenital Talipes Calcaneus.

**97e.** Casts of the Feet of a Child aged nine months. Both Feet are in a condition of Congenital Talipes Calcaneus.

**97f.** Cast of the Left Foot of a Boy aged 8 in a condition of Talipes Calcaneus. It had existed since infancy. All the Muscles of the Limb, which was two inches longer than the Right Leg, were wasted.

**98d.** Cast of the Front of a Man's Chest showing at the upper part of the left side a large ill-defined swelling due to an Aneurysm of the Arch of the Aorta.

See *John Ward Book*, 1891, *sub* Samuel Olley.

**138a-3.** Papier-maché Cast of an enormously distended Gall-Bladder and Bile Ducts. A soft cancerous growth in the Duodenum had caused the obstruction. The Bile Ducts in the Liver were proportionately dilated.

Prepared and presented by C. W. Cathcart, Esq.

**138a-4.** Papier-maché Cast of the under surface of the Liver, greatly enlarged from rapidly growing malignant disease.

Prepared and presented by C. W. Cathcart, Esq.

**153c.** Cast of the Front of the Chest of a Man, showing a true Keloid of Alibert over the centre of the Sternum.

A drawing of the same case is preserved in Series lvii. No. 401a, to which refer.
See *Male Surgical Register*, vol. iii. (1891), No. 2901.

**173b.** Papier-maché Cast of the Head and Neck, showing Sebaceous Cysts. One of these has become epitheliomatous, and has caused infiltration of the tissues of the Neck.

The patient was a woman aged 60, and had observed the cysts for more than thirty years. A few months before the cast was taken one of these had begun to extend rapidly. This was followed by the enlargement of the lymphatic glands in the neck and behind the ear, and by infiltration of the surrounding parts.

Prepared and presented by C. W. Cathcart, Esq.

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**182b.** Papier-maché Cast of Condylomata on the Vulva of a Young Woman.

Prepared and presented by C. W. Cathcart, Esq.

**209a.** Cast of the Front of the Pelvis of a Man aged thirty-six, showing a large Osteo-Sarcoma growing from the left Pubic Bone.

See *Male Surgical Register*, vol. v. (1891), No. 3259.

## SERIES LVII.

## DRAWINGS AND PHOTOGRAPHS OF DISEASED OR INJURED PARTS.

**6a.** Drawings of a case of Symmetrical Periostitis of both Femora in a Child, with unusual formation of bone substance.

(*a.*) Represents the general outline of the Right Femur, and also the appearances seen after making a transverse section through the most prominent part of the swelling.

(*b.*) Shows the appearances, when fresh, of a longitudinal section through the lower part of the Left Femur. (Leonard Mark, Esq.)

The bones themselves are preserved in Series i. Nos. 39a and 39b, to which refer for details of the case.

**26b.** Drawing of a very Large Osteo-Sarcoma of the Right Humerus. (Leonard Mark, Esq.)

The tumour had existed for eight years, but had increased very rapidly during the last year. It was removed by amputation at the shoulder-joint, and the patient made a good recovery. The limb with the tumour weighed 33 lbs. after removal.

One-half of the tumour is preserved in Series i. No. 474a, and microscopical sections are preserved in Series lv. No. 60a.

See *Male Surgical Register*, vol. iv. (1892), No. 1408.

**26c.** A Photograph of the Patient from whom the preceding Drawing (No. 26b) was taken. (J. H. Griffiths, Esq.)

**107b.** Drawing of the Right Arm of a Man, showing a Varicose Aneurysm at the bend of the Elbow. All the Veins of the Forearm are much distended. A loud bruit could be heard over the Veins as high up as the Subclavian. There was evidently a communication between the Brachial Artery and the Median Vein. (Leonard Mark, Esq.)

See *Male Surgical Register*, vol. iii. (1892), No. 198.

**133b.** Drawing of a Lung in which there is marked dilatation of two of the Bronchial Tubes. (Leonard Mark, Esq.)

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**177d.** Two Photographs of a large Congenital Cyst in the substance of the Tongue of a Child aged three years.

The cyst, which was removed by operation, together with a portion of the tongue, is preserved in Series xii. No. 1779a.

Presented by Stephen Paget, Esq.

**185b.** Drawing of a Tongue, the edges of which, on both sides, are deeply fissured. (Leonard Mark, Esq.)

From a young man aged 20, who attended in the Surgical Out-patient Department. He denied having suffered from syphilis, and no sufficient cause for the condition was discovered. He quickly improved under simple treatment.

**186b.** Drawing of a Tubercular Ulcer on the Mucous Membrane lining the Lower Lip. (Leonard Mark, Esq.)

The patient was a woman aged 36. The ulcer had existed for twelve months. It was freely excised.
See *Female Surgical Register*, vol. iv. (1892), No. 895.

**214a.** Drawings showing the appearances, when fresh, of the Cardiac end of the Stomach and a portion of the Duodenum after death from poisoning by a mixture of Nitric and Sulphuric Acids. The Mucous Membrane of the Œsophagus and of the Intestine is coloured a bright green. A large portion of the Stomach has been completely destroyed, leaving a ragged Ulcer. The Mucous Membrane surrounding this is a deep black. (Leonard Mark, Esq.)

See *Medical Post-Mortem Register*, vol. xviii. p. 295.

**263d.** Two Drawings showing the front and side views of the Rectum and External Organs of Generation of a Woman who had a congenitally imperforate Anus with a recto-vaginal Fistula. The Rectum is enormously distended, but its walls are not unduly thickened. The lumen of the Fistula barely admitted the passage of the glass rod which has been passed through from the Bowel into the Vagina. (Leonard Mark, Esq.)

The patient was a woman aged 23 years at the time of her death, which resulted from a severe burn: she was married, but had not borne children: the deformity was not discovered till a few days before her death, when it was desired to administer an opium suppository for the relief of pain.
The specimen is in the Museum of the Halifax Infirmary.

**285b.** Drawing of a greatly thickened Gall-Bladder, the Walls of which are in places ulcerated. Death ensued on rupture through one of these Ulcers. (Leonard Mark, Esq.)

The specimen is preserved in Series xxii. No. 2263a, from a man aged 67. See *Medical Post-Mortem Register*, vol. xvii. p. 294.

**372a.** Drawing of a Child who had a Large Congenital Encephalocele situated over the left parietal region. (Leonard Mark, Esq.)

At the time the drawing was made the child was 12 days old.
See *Male Surgical Register*, vol. i. (1891), No. 3353.

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**401a.** Drawing of the Front of a Man's Chest, showing a true Keloid of Alibert over the centre of the Sternum. (Leonard Mark, Esq.)

The man was a sailor, aged 35, and stated that the keloid commenced to grow without any known cause twelve years previously: a small nodule of a similar nature over the right mammary gland had been noticed for seven months.

A cast of the same case is preserved in Series lvi. No. 153c.

See *Male Surgical Register*, vol. iii. (1891), No. 2901.

**412c.** Drawing of an Eruption which appeared on the Face and Hands.

The patient was a man aged 61: the eruption began on the face and caused much swelling: as this subsided the spots on the hands, both of which were similarly affected, occurred.

**418a.** Enlarged Photograph of the Face of a Man who suffered from Tubercular Leprosy. The Skin covering the lower half of his Forehead and the rest of his Face is very thick, and is thrown into permanent folds with deeply grooved wrinkles.

The patient was a blacksmith, aged 64, who had lived for 35 years at the Cape of Good Hope: the change in his face had come on gradually during the past twelve months: the skin over his ears and the backs of his hands was similarly affected.

**422c.** Drawing of the Right Arm and Forearm of a Young Woman who suffered from Urticaria Pigmentosa: a similar eruption existed on the other Arm and on the Trunk. (Leonard Mark, Esq.)

See *Female Surgical Register*, vol. v. (1891), No. 1914.

**429e.** Drawing of a Bullous Eruption which occurred on the Foot of a Woman aged 45. (Leonard Mark, Esq.)

**435b.** Drawing of the Lower Part of the Face of a Man showing a Primary Syphilitic Sore on the chin. (Leonard Mark, Esq.)

**GOUT.**

**463d.** Drawing of the Left Hand of a Man. Over the region of the two Distal Phalanges of the Little Finger is a large "gouty" swelling, the Skin of which is ulcerated in places. (Leonard Mark, Esq.)

**464b.** Drawing of the Right Leg and Foot showing a large patch of Lupus, affecting mainly the inner side of the Calf: the central portion is scarred over, but the edges are formed by exuberant granulations springing from a large ulcerated surface. (Leonard Mark, Esq.)

The patient was a lady aged 68: the disease commenced twenty years previously during convalescence from a severe attack of small-pox.

The leg itself is preserved in Series xxxv. No. 2704a.

**517b.** Drawing of a Fluctuating Swelling which presented at the Vulva of an Infant aged seven weeks: it proved to be an imperforate Hymen pushed down by a collection of pus in the Vagina and Uterus. (Leonard Mark, Esq.)

The child subsequently died. The parts are preserved in Series xliv. No. 3016a, to which refer.

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**517c.** A Drawing of the Pelvic Organs removed after death from the same case as that from which the preceding drawing was made. (Leonard Mark, Esq.)

**519c.** Drawing of a Section through an early Abortion. The decidual cavity is distended with Blood. (Leonard Mark, Esq.)

The specimen is preserved in Series xlv. No. 3056a.

**523a.** Drawing of a Tumour ("Duct Carcinoma") of the Female Breast after removal. The Breast and the Nipple have been laid open: near the Nipple one of the Gland Ducts is much dilated, and lying in it and adherent to its walls is a small papillary growth: this is the essential characteristic of the disease. (Leonard Mark, Esq.)

See *Female Surgical Register*, vol. iii. (1891), No. 495.

**531l.** Two Drawings of the Microscopical Appearances seen ($\alpha$) under a low, and ($\beta$) under a high power, of a section taken through the Skin of a case of "Eczema of the Nipple" (Paget's Disease). Several spaces containing nucleated bodies occur in the deeper layers of the Epidermis: these are the so-called "Psorosperms," which are thought by some pathologists to be the direct cause of the ulceration and resulting Carcinoma. (Leonard Mark, Esq.)

**543k.** Drawings of the Feet of a Child aged four years who had symmetrical Gangrene of the tips of the Toes. The Left Foot is rather more affected than the Right. (Leonard Mark, Esq.)

See *Elizabeth Ward Book* for 1891, *sub* Robert Steggall.

**543l.** Drawing of the Leg of a Young Woman in an early stage of Moist Gangrene. From the junction of the upper and middle thirds of the Leg downwards the Skin is discoloured and of a dusky hue. The line of demarcation is distinct, and there is an area of inflammation immediately above the blue and livid Skin. (Leonard Mark, Esq.)

The patient was a young woman aged 21. Amputation above the knee was performed.
See *Female Surgical Register*, vol. iii. (1892), No. 138.

**543m.** Drawings of the Ears of a Man who had Symmetrical Gangrene of the Pinna. The Right Ear is the more affected, and there has been considerable loss of substance on that side. (Leonard Mark, Esq.)

See *Male Surgical Register*, vol. ii. (1892), No. 1126.

**546a.** Drawing of a Large Lobulated Tumour with an Ulcerated Surface which grew from the Ungual Phalanx of the Thumb. The Nail itself has become partially detached, but remains imbedded in the Tumour. Its structure is that of a Carcinoma. (Leonard Mark, Esq.)

One-half of the tumour is preserved in Series l. No. 3357a, and microscopical sections in Series lv. No. 777a.

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# TERATOLOGICAL CATALOGUE.

## SERIES VI.—ABNORMAL CONDITIONS OF THE DIGESTIVE ORGANS.

### CLASS I.—VARIATION.

*(d.) Of the Intestines.*

**3632c.** A Cæcum with a Portion of the Ileum, to which is attached an abnormally long Vermiform Appendix. This is fixed by a Mesentery of its own to the back part of Ileum, and when unravelled measures rather over 8½ inches in length. It is not dilated at any point and is pervious throughout.

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## SERIES VIII.—ABNORMAL CONDITIONS OF THE GENERATIVE ORGANS.

### CLASS V.—ARREST OF DEVELOPMENT.

**UTERUS UNICORPOREUS ET VAGINA DUPLEX.**

**3673c.** An Uterus with its Appendages. The upper part of the Vagina is divided by an antero-posterior septum into two channels of nearly equal capacity. The Mucous Membrane is continuous on both sides of the septum with that lining the rest of the two Vaginæ. At the upper part of the Vaginal Cavities the septum stops abruptly; there is only one Cervix and one Os.

Both sides of the Broad Ligament are studded with small nodular, more or less pedunculated growths, and the Ovaries are involved and affected in a similar way. Microscopical examination showed these to be carcinomatous in character, probably arising in the Ovaries. Other portions of the Peritoneum, especially that covering the under surface of the Liver (see Series xvi. No. 1886d) were also extensively involved.

The patient was a girl aged 15.

Microscopical sections of the carcinomatous nodules are preserved in Series lv. No. 244a.

See *Medical Post-Mortem Register*, vol. xvii. p. 280.

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## ANATOMICAL AND PHYSIOLOGICAL CATALOGUE.

### SERIES XXVI.

**1028a.** The Eye of a Greenland Whale (*Balæna mysticetus*). A longitudinal section has been made through the Eye and shows the Optic Nerve as it passes through the numerous layers of the very thick Sclerotic.

The whale was taken in lat. 78° 40′ N. and long 1° E. on May 18, 1891, by the crew of the s.s. *Hope* of Peterhead.

Presented by A. C. Lindsay, Esq.

### SERIES XXIX.

### ORGANS OF GENERATION IN THE MALE.

**1125b.** The Os Penis of a Himalayan Bear.

Presented by B. W. Gowring, Esq.

### SERIES XXXI.

**1159a.** One Half of a Mesial Section through the Pelvic Organs of a Female Child aged one month. Owing to the small size of the Pelvis the Bladder is practically an Abdominal Viscus; the Urethra is relatively much longer than normal.

### SERIES XXXIV.

### DISSECTIONS.

**1336b.** Dissection of the Left Hemisphere of a Brain on which the motor areas and other localities are indicated.

The numbers and areas are taken as far as possible from the diagrams of Professor Ferrier (*Functions of the Brain*, 2nd edition, p. 478).

The Brains of a Monkey, Dog, and Cat are added for comparison.

The explanation of the numbers taken from Professor Ferrier's book is as follows:—

*Human Brain* (p. 480).

1. Movements of opposite leg and foot, such as are concerned in locomotion.
2, 3, and 4. Complex movements of arms and legs (climbing, swimming, &c.).
5. Extension forwards of arm and hand.
6. Movements of hand and forearm in which the biceps is particularly concerned, viz., supination of hand and flexion of forearm.
7 and 8. Elevators and depressors of angle of mouth.
9 and 10. Movements of lips and tongue (Broca's convolution)

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11. Platysma and retraction of angle of mouth.
12. Lateral movements of head and eyes, elevation of eyelids, and dilatation of pupils.

*a*, *b*, *c*, *d*. Movements of fingers and wrist.

13 and 13′. Vision.

14. Hearing.

*Brain of Monkey* (p. 240).

1. Advancement of opposite hind-limb, as in walking.
2. Flexion and outward rotation of the thigh, rotation inwards of the leg, with flexion of the toes.
3. Movements of tail.
4. Adduction, extension, and retraction of opposite arm, and pronation of hand.
5. Extension forwards of the opposite arm.

*a*, *b*, *c*, *d*. Clenching of the fist.

6. Flexion and supination of forearm.
7. Retraction and elevation of angle of the mouth.
8. Elevation of ala of nose and upper lip.

9 and 10. Opening of the mouth, with protrusion (9) and retraction (10) of the tongue.

11. Retraction of angles of the mouth.
12. Eyes open widely, pupils dilate, head and eyes turn to opposite side.

13 and 13′. Eyes move to opposite side.

14. Pricking of the opposite ear, head and eyes turn to the opposite side, pupils dilate widely.
15. Torsion of the lips and semi-closure of the nostril on the same side.

*Brain of Dog* (p. 250).

1. Opposite hind-leg advanced.
3. Wagging of the tail.
4. Retraction and adduction of the opposite fore-limb.
5. Elevation of shoulder and extension forwards of the opposite fore-limb.
7. Closure of opposite eye.
8. Retraction and elevation of opposite angle of the mouth.
9. Opening of mouth and movements of the tongue.
11. Retraction of angle of mouth.
12. Wide opening of eye, dilatation of pupils with movements of eyeballs and head to opposite side.
13. Movement of eyeballs to opposite side.
14. Sudden retraction of opposite ear.
15. Torsion of nostril on the same side.

*Brain of Cat* (p. 257).

1. Advance of opposite hind-leg as in walking.
4. Retraction and adduction of the opposite fore-leg.
5. Elevation of shoulder, with flexion of the forearm and paw, and clutching or grasping action of the paw, with protrusion of claws.
7. Elevation of angle of mouth and cheek, with closure of the eye.
8. Retraction and elevation of angle of mouth, with drawing downward and forward of the ear.
9. Opening of mouth and movements of the tongue.
13. Movements of eyeball to opposite side.
14. Pricking of ear, and head and eyes turn to opposite side.
15. Elevation of lip and torsion of the nostril on the same side.
16. Divergence of the lips.

**1382a.** A Dissection of the Dorsum of the Foot, showing the Tendons, Vessels, and Nerves.

Dissected by A. E. Cumberbatch, Esq.

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## SERIES XXXVI.

## CATALOGUE OF INVERTEBRATA.

### SUB-KINGDOM IV.—ANNULOSA. (B.) ARTHROPODA.

### CLASS I.—CRUSTACEA. (E.) PODOPHTHALMIA.

**1531a.** A Brazilian Prawn (Palæmon Serratus).

Presented by J. K. K. Benjamin, Esq.

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## TERATOLOGICAL CATALOGUE.

## SERIES XXXVII.

## CASTS AND MODELS.

### CLASS II.—MALFORMATIONS.

**68a.** Cast of the Upper Part of the Back and Shoulders of a Young Woman aged 21. The Left Scapula is raised, and fixed to the Spines of the Upper Dorsal Vertebræ, from ossification of the Muscles in that region. The posterior border of the Scapula is unduly prominent.

See *Female Surgical Register*, vol. ii. (1892), No. 710.

**70e.** Cast of the Right Hand of a Boy, in which there is congenital absence of the Ring and Little Fingers, with fusion of the Index and Middle Fingers.

A cast of the right foot of the same boy, also congenitally deformed, is preserved in this Series, No. 103a.

**78c.** Cast of the Left Hand of a Child aged one month, showing a Supernumerary Digit attached to the ulnar side of the little Finger. A similar abnormality existed in the Right Hand.

**78d.** Cast of the Left Foot of the same Child from which the preceding Cast was taken. It also shows a supernumerary Digit. A similar abnormality existed in the Right Foot.

As far as could be ascertained, no abnormal conditions of the hands or feet had occurred among the child's relatives.

**79b.** Casts of the two Hands of a Girl, showing a congenital malformation of the left Thumb. Springing from the middle of the Metacarpal Bone of the Index Finger is a rudimentary supernumerary Digit, having a well-formed Nail, and which is bent downwards to meet the tip of the

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Thumb; this is also deformed. These two Digits could be separated and apposed to a slight extent. The right Thumb is small and stunted.

See *Female Surgical Register*, vol. ii. (1892), No. 710.

**103a.** Cast of the Right Foot and Leg of a Boy in which there is congenital absence of the Fibula and two outer Toes, with partial fusion of the second and third Toes. There is considerable eversion of the Foot. The whole Leg was about five inches shorter than that of the opposite side.

A cast of the right hand of the same boy, also congenitally deformed, is preserved in this Series, No. 70e.

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## SUMMARY OF SCHOLARSHIPS AND PRIZES

### Obtainable by Students at St. Bartholomew's Hospital.

---

**At Entrance:—**

| | | | |
|---|---|---|---|
| Senior Entrance Scholarship in Physics and Chemistry | £75 | 0 | 0 |
| Senior Entrance Scholarship in Biology and Physiology | 75 | 0 | 0 |
| Junior Entrance Scholarship in Science | 150 | 0 | 0 |
| Preliminary Scientific Exhibition | 50 | 0 | 0 |
| Jeaffreson Exhibition | 20 | 0 | 0 |
| Shuter Scholarship | 50 | 0 | 0 |

**At End of First Year:—**

| | | | |
|---|---|---|---|
| Junior Scholarship in Anatomy and Biology (First) | 30 | 0 | 0 |
| Junior Scholarship in Anatomy and Biology (Second) | 20 | 0 | 0 |
| Junior Scholarship in Chemistry and Physics and Histology (First) | 25 | 0 | 0 |
| Junior Scholarship in Chemistry and Physics and Histology (Second) | 15 | 0 | 0 |
| Treasurer's Prize | 5 | 0 | 0 |

**At End of Second Year:—**

| | | | |
|---|---|---|---|
| Senior Scholarship | 50 | 0 | 0 |
| Foster Prize | 6 | 0 | 0 |
| Harvey Prize | 6 | 6 | 0 |
| Wix Prize | 5 | 0 | 0 |
| Hichens Prize | 7 | 5 | 0 |

**At End of Third and Later Years:—**

| | | | |
|---|---|---|---|
| Kirkes Scholarship and Gold Medal | 30 | 0 | 0 |
| Brackenbury Medical Scholarship | 30 | 0 | 0 |
| Brackenbury Surgical Scholarship | 30 | 0 | 0 |
| Lawrence Scholarship and Gold Medal | 42 | 0 | 0 |
| Bentley Prize | 6 | 0 | 0 |
| Skynner Prize | 13 | 13 | 0 |
| Burrows Prize | 10 | 10 | 0 |
| Matthews Duncan Prize and Gold Medal | | | |



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# EXAMINATIONS, 1890-91.

*Lawrence Scholarship and Gold Medal*—
T. J. DYALL.

*Brackenbury Medical Scholarship*—
C. COLES.

*Brackenbury Surgical Scholarship*—
R. BROWN, E. W. G. MASTERMAN } Æq.

*Senior Scholarship in Anatomy, Physiology, and Chemistry*—
J. S. SLOANE.

*Open Scholarships in Science, Chemistry, and Physics*—
S. GILLIES.

*Open Scholarship in Biology and Physiology*—
F. A. SMITH, P. H. SMITH } Æq.

*Open Scholarship (Junior) in Biology and Physiology*—
E. W. GROVES.

*Preliminary Scientific Exhibition*—
M. G. PEARSON.

*Jeaffreson Exhibition*—
G. A. C. CALVERT.

*Kirkes Scholarship and Gold Medal*—
NOT AWARDED.

*Bentley Prize (Surgical)*—
J. MORRISON.

*Hichens Prize*—
W. J. GILLESPIE.

*Wix Prize*—
J. W. PICKERING.

*Shuter Scholarship*—
J. G. BLANDFORD.

*Harvey Prize*—
1. F. FRASER.
2. C. P. WHITE.
3. P. C. BARFORD.
4. T. HAMPTON.

*Skynner Prize.*
E. W. G. MASTERMAN.

*Burrows Prize.*
A. G. GANE.

## PRACTICAL ANATOMY.

| SENIOR. | JUNIOR. |
|---|---|
| *Foster Prize*—H. B. MEAKIN. | *Treasurer's Prize*—J. CURRIE. |
| 2. R. BALLARD. | 2. G. A. C. CALVERT. |
| 3. T. HAMPTON. | 3. H. A. HUTT. |
| 4. E. R. FOX, F. C. ROBINSON } Æq. | 4. J. H. HUGO. |
| 6. F. FRASER. | 5. T. P. LEGG. |
| 7. H. M. PENTREATH. | 6. J. H. MEACHER, J. S. STEVENSON } Æq. |
| 8. S. CORNISH, R. H. WILKINS } Æq. | 8. E. P. TURNER. |
| | 9. A. WOODWARD. |

*Junior Scholarships*—

| | |
|---|---|
| *Anatomy and Physiology.*—F. A. SMITH. E. J. TOYE. | *Chemistry and Physics.*—E. J. TOYE. J. CURRIE, E. G. B. DRURY } Æq. |

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# EXAMINATIONS, 1891-92.

*Lawrence Scholarship and Gold Medal*—
E. W. G. MASTERMAN.
*Brackenbury Medical Scholarship*—
E. H. E. STACK.
*Brackenbury Surgical Scholarship*—
A. H. BUCK, A. N. WEIR } Æq.
*Senior Scholarship in Anatomy, Physiology, and Chemistry*—
E. J. TOYE.
F. FRASER (*prox. acc.*)
*Open Scholarship in Chemistry and Physics*—
H. COLEMAN, T. HORDER } Æq.
*Open Scholarship in Biology and Physiology*—
H. T. GILLETT.
*Open Scholarship (Junior) in Biology and Physiology*—
V. H. BLACKMAN.
*Preliminary Scientific Exhibition*—
J. HUSSEY.
*Jeaffreson Exhibition*—
F. H. NIMMO.
*Kirkes Scholarship and Gold Medal*—
H. L. BROOKSBANK.
*Bentley Prize (Surgical)*—
H. J. PATERSON.
*Hichens Prize*—
H. J. PATERSON.
*Wix Prize*—
NO AWARD.
*Harvey Prize*—

1. M. G. PEARSON.
2. J. CURRIE.
3. G. A. C. CALVERT.
4. G. H. SOWRY.
5. A. W. COCHRANE.
6. E. J. TOYE.
7. F. A. SMITH.
8. S. P. KESTEVEN.

*Burrows Prize.*
H. W. ARMSTEAD, A. S. BLACKWELL } Æq.
*Skynner Prize.*
A. S. BLACKWELL, W. B. JONES } Æq.

## PRACTICAL ANATOMY.

*Treasurer's Prize*—S. P. HUGGINS.
2. G. E. DODSON.
3. F. P. W. BRIGSTROKE.
4. W. R. STOWE.
5. J. P. MAXWELL.
6. E. J. SIMONDS.
7. W. R. MILLER.
8. L. S. MARKS.
9. F. H. NUNN.

*Foster Prize*—J. H. MEACHER.
2. T. P. LEGG.
3. H. T. GILLETT.
4. A. WOODWARD.
5. G. H. GOWRY.
6. J. CURRIE.
7. G. A. C. CALVERT.
8. M. G. PEARSON.
9. A. W. R. COCHRANE.

*Shuter Scholarship*—
W. M. BORCHERDS.
*Junior Scholarships*—
*Anatomy and Physiology.*—J. T. HORDER, J. HUSSEY.
*Chemistry and Physics.*—J. HUSSEY, J. T. HORDER.

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# ENTRANCE SCHOLARSHIPS,

## OCTOBER

## 1892.

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*Open Scholarships in Science.*

*Biology and Physiology—*

WALTER D'ESTE EMERY.

*Chemistry and Physics—*

CHARLES TODD.

*Preliminary Scientific Exhibition—*

J. H. CHURCHILL.

*Jeaffreson Exhibition—*

J. H. THURSFIELD.

*Junior Open Scholarship in Science.*

STANLEY B. ATKINSON.

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# ST. BARTHOLOMEW'S HOSPITAL & COLLEGE.

## THE MEDICAL AND SURGICAL STAFF.

Consulting Surgeons—Sir J. Paget, Bart., D.C.L., LL.D., F.R.S., Mr. Luther Holden, Sir William S. Savory, Bart., F.R.S.

Physicians—Dr. Andrew, Dr. Church, Dr. Gee, Sir Dyce Duckworth.

Surgeons—Mr. Thomas Smith, Mr. Willett, Mr. Langton, Mr. Marsh, Mr. Butlin.

Assistant-Physicians—Dr. Hensley, Dr. Brunton, F.R.S., Dr. Norman Moore, Dr. S. West.

Assistant-Surgeons—Mr. Walsham, Mr. Cripps, Mr. Bruce Clarke, Mr. Bowlby, Mr. Lockwood.

Physician-Accoucheur—Dr. Champneys.

Assistant-Physician-Accoucheur—Dr. Griffith.

Ophthalmic Surgeons—Mr. Power, Mr. Vernon.

Aural Surgeon—Mr. Cumberbatch.

Dental Surgeons—Mr. Paterson, Mr. Ackery.

Assistant-Dental Surgeons—Mr. Read, Mr. Ackland.

Administrator of Anæsthetics—Mr. Mills.

Assistant-Administrators of Anæsthetics—Mr. Gill, Mr. Grant.

Medical Registrar—Dr. Ormerod.

Surgical Registrar—Mr. Berry.

Administrator of Electricity—Dr. Lewis Jones.

Casualty Physicians—Dr. Andrewes, Dr. Cautley, Dr. Bowman.

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## LECTURES.

Medicine—Dr. Gee, Sir Dyce Duckworth.

Clinical Medicine—Dr. Andrew, Dr. Church, Dr. Gee, Sir Dyce Duckworth.

Surgery—Mr. Willett, Mr. Marsh.

Clinical Surgery—Mr. Thomas Smith, Mr. Willett, Mr. Langton, Mr. Marsh, Mr. Butlin.

Descriptive and Surgical Anatomy—Mr. Walsham, Mr. Bruce Clarke.

General Anatomy and Physiology—Dr. Klein, F.R.S.

Histology—Dr. Klein, F.R.S.

Chemistry and Practical Chemistry—Dr. Russell, F.R.S.

Materia Medica—Dr. Brunton, F.R.S.

Forensic Medicine—Dr. Hensley.

Public Health—Dr. Thorne Thorne, F.R.S.

Midwifery and the Diseases of Women and Children—Dr. Champneys.

Botany—Rev. George Henslow.

Pathological Anatomy—Dr. Norman Moore.

Comparative Anatomy—Dr. Shore.

Ophthalmic Medicine and Surgery—Mr. Power.

Mental Diseases—Dr. Claye Shaw.

Physics—Mr. F. W. Womack.

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## DEMONSTRATIONS.

Morbid Anatomy—Dr. Ormerod.

Diseases of the Skin—Dr. S. West.

Orthopædic Surgery—Mr. Walsham.

Diseases of the Ear—Mr. Cumberbatch.

Diseases of the Eye—Mr. Vernon.

Diseases of the Larynx—Mr. Bowlby.

Dental Surgery—Mr. Paterson, Mr. Ackery.

Anæsthetics—Mr. Mills.

Practical Surgery—Mr. Bowlby, Mr. D'Arcy Power.

Practical Anatomy—Mr. Jessop, Dr. Herringham.

*Assistant-Demonstrators*—Mr. Wallis, Mr. Waring, Mr. Bailey, Mr. McAdam Eccles.

Operative Surgery—Mr. Lockwood, Mr. Bowlby, Mr. D'Arcy Power.

Practical Physiology—Dr. Harris.

*Assistant-Demonstrators*—Dr. Cautley, Dr. Fletcher.

Practical Pharmacy—Dr. Brunton, F.R.S.

Surgical Pathology—Mr. Bowlby.

Practical Medicine—Dr. S. West.

*Assistant-Demonstrators*—Dr. Garrod, Dr. Calvert.

Practical Midwifery—Mr. Roberts.

Medical Electricity—Dr. Lewis Jones.

Bacteriology—Dr. Harris, Mr. Lockwood.

Practical Biology—Dr. Shore.

*Assistant-Demonstrators*—Mr. Groves, Mr. Pickering.

Curator of the Museum—Mr. Edgar Willett.

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## COLLEGIATE ESTABLISHMENT.

Warden—Dr. SHORE.

Students can reside within the Hospital walls, subject to the College regulations.

Fifteen Scholarships, varying in value from £10 to £150, are awarded annually. See page 353.

Further information respecting Scholarships, Pupils' Appointments, and other details, may be obtained from Dr. SHORE, and at the Museum and Library.

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EDINBURGH AND LONDON.

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# STATISTICAL TABLES

OF THE

## Patients under Treatment

IN THE WARDS OF

# ST. BARTHOLOMEW'S HOSPITAL

## DURING 1891.


BY

THE MEDICAL REGISTRAR,

J. A. ORMEROD, M.D. (Oxon.)—F.R.C.P.;

AND

THE SURGICAL REGISTRARS,

ANTHONY A. BOWLBY, F.R.C.S., AND C. B. LOCKWOOD, F.R.C.S.



London:

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1892.



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# PREFACE.

The Classification of Diseases in the Medical Tables is that adopted by the College of Physicians in their Nomenclature of Diseases.



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# ST. BARTHOLOMEW'S HOSPITAL.

## 1891.

| | |
|---|---|
| Number of Beds in Medical Wards (including 14 for Diseases of Women) | 236 |
| " " " Surgical " { including 6 for Diseases of Women and 26 for Ophthalmic Cases } | 395 |
| " " " Unassigned ... ... ... ... ... ... ... | 41 |
| | 672 |

One or other of the wings was closed during the whole year, chiefly in consequence of the re-organization of the drainage.

### GENERAL STATEMENT OF THE PATIENTS UNDER TREATMENT DURING THE YEAR 1891.

| | | | |
|---|---|---|---|
| Patients remaining in January 1st, 1891 :— | | | |
| Medical ... ... ... ... ... | 197 | | |
| Surgical ... ... ... ... ... | 333 | ... 530 | |
| | | | ... 6,123 |
| Admitted during the year 1891 :— | | | |
| Medical ... ... ... ... ... | 2,074 | | |
| Surgical ... ... ... ... ... | 3,519 | ... 5,593 | |
| Discharged :— | | | |
| Medical ... ... ... ... ... | 1,648 | | |
| Surgical ... ... ... ... ... | 3,344 | ... 4,992 | |
| Died :— | | | |
| Medical ... ... ... ... ... | 445 | | |
| Surgical ... ... ... ... ... | 168 | ... 613 | ... 6,123 |
| Remaining in January 1st, 1892 :— | | | |
| Medical ... ... ... ... .. | 178 | | |
| Surgical ... ... ... ... ... | 340 | ... 518 | |

Patients brought in Dead (or dying in the Surgery) ... 43

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# OCCUPATIONS OF MALE PATIENTS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Agents ... ... ... | 2 | Coffee-house keeper ... | 1 | Hair dressers ... ... | 2 |
| Asphalters ... ... | 2 | Colliers... ... ... | 7 | Hammermen ... ... | 4 |
| Assistants ... ... | 18 | Commissionaire ... | 1 | Hawkers ... ... | 14 |
| Author... ... ... | 1 | Compositors ... ... | 28 | Horse keepers... ... | 7 |
| | | Confectioners ... ... | 3 | House keeper ... ... | 1 |
| | | Cooks ... ... ... | 6 | House surgeon ... | 1 |
| | | Cooper ... ... ... | 1 | House physicians ... | 2 |
| | | Cork cutter ... ... | 1 | | |
| Bakers ... ... ... | 11 | | | | |
| Bargee ... ... | 1 | | | | |
| Barmen ... ... | 5 | | | | |
| Basket makers ... | 2 | | | | |
| Beadle ... ... ... | 1 | Dealers... ... ... | 19 | | |
| Blacksmiths ... ... | 7 | Decorators ... ... | 2 | Indiarubber worker ... | 1 |
| Boiler makers ... ... | 3 | Dentist ... ... | 1 | Ironmonger ... ... | 1 |
| Bookbinders ... ... | 14 | Diver ... ... ... | 1 | | |
| Book-keeper ... ... | 1 | Dockers ... ... | 4 | | |
| Booksellers ... ... | 2 | Drapers ... ... | 3 | | |
| Boot and Shoe makers | 48 | Driller ... ... ... | 1 | | |
| Bottlers ... ... | 3 | Drivers... ... ... | 12 | | |
| Bottle washers ... | 2 | Drovers ... ... | 3 | Jewellers ... ... | 2 |
| Box carrier ... ... | 1 | Dye factor ... ... | 1 | Joiner ... ... ... | 1 |
| Box makers ... ... | 2 | | | | |
| Brakesmen ... ... | 4 | | | | |
| Brewers' men ... ... | 15 | | | | |
| Bricklayers ... ... | 26 | | | | |
| Brick maker ... ... | 1 | Electro-typer ... ... | 1 | | |
| Brush makers ... ... | 3 | Engine drivers ... | 7 | Labourers ... ... | 660 |
| Builders ... ... | 4 | Engineers ... ... | 17 | Lamp lighter ... ... | 1 |
| Butchers ... ... | 34 | Errand boys ... ... | 67 | Laundry worker ... | 1 |
| Butler ... ... ... | 1 | | | Lavatory attendant ... | 1 |
| | | | | Looking-glass maker... | 1 |
| | | | | Lock smith ... ... | 1 |
| | | Farmer ... ... | 1 | | |
| | | Fireman ... ... | 1 | | |
| Cab drivers ... ... | 19 | Fisherman ... ... | 1 | | |
| Cab washers ... ... | 4 | Fishmongers ... ... | 13 | | |
| Cabinet makers ... | 12 | Florists ... ... | 3 | | |
| Carmen ... ... | 35 | Footmen ... ... | 10 | Masons... ... ... | 11 |
| Carpenters ... ... | 20 | Fret cutter ... ... | 1 | Match maker ... ... | 1 |
| Carriers ... ... | 2 | French polishers ... | 26 | Messengers ... ... | 3 |
| Carver ... ... ... | 1 | | | Metal workers... ... | 13 |
| Carters... ... ... | 21 | | | Milkmen ... .. | 6 |
| Case makers ... ... | 2 | | | Millers ... ... ... | 2 |
| Cellarmen ... ... | 2 | | | Musician ... ... | 1 |
| Checkers ... ... | 2 | Gasfitters ... ... | 16 | Musical instrument | |
| Cheesemongers ... | 3 | Gas workers ... ... | 4 | maker ... ... | 1 |
| Chemist ... ... | 1 | Glass workers ... ... | 4 | | |
| Clerks ... ... ... | 44 | Glover ... ... ... | 1 | | |
| Clickers ... ... | 4 | Greengrocers ... ... | 4 | | |
| Clothier ... ... | 1 | Grinders ... ... | 2 | | |
| Coachmen ... ... | 18 | Grocers... ... ... | 2 | | |
| Coffee roaster ... ... | 1 | Gunsmith ... ... | 1 | News vendors ... ... | 3 |

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# OCCUPATIONS OF MALE PATIENTS (*continued*).

| | | |
|---|---|---|
| Office boys ... ... 12 | Road maker ... ... 1 | Tailors ... ... ... 16 |
| Oil and colour man ... 1 | Roller maker ... ... 1 | Thermometer maker ... 1 |
| Optician ... ... 1 | Rug maker ... ... 1 | Timekeepers ... ... 4 |
| Ostler ... ... ... 1 | Rulers ... ... ... 2 | Tobacconists ... ... 2 |
| | | Travellers ... ... 3 |
| | | Tuner ... ... ... 1 |
| | | Turners ... ... 2 |
| | | Typefounders ... ... 3 |
| Packers ... ... 17 | | |
| Painters ... ... 43 | | |
| Paper cutter ... ... 1 | | |
| Paper roller ... ... 1 | Sailors ... ... ... 19 | |
| Paper stainer ... ... 1 | Salesmen ... ... 3 | |
| Pawnbroker ... ... 1 | Saw maker ... ... 1 | Umbrella makers ... 4 |
| Perambulator maker ... 1 | Sawyers ... ... 4 | Undertaker ... ... 1 |
| Physician ... ... 1 | Scalesmen ... ... 2 | Upholsterer ... ... 1 |
| Picture-frame maker... 1 | Scavenger ... ... 1 | |
| Pig scalder ... ... 1 | Schoolboys ... ... 375 | |
| Pipe maker ... ... 1 | Scullion ... ... 1 | |
| Plasterers ... ... 3 | Sealskin dresser ... 1 | |
| Plumbers ... ... 4 | Secretary ... ... 1 | |
| Policemen ... ... 6 | Servants ... ... 2 | |
| Polishers ... ... 3 | Shipwrights ... ... 5 | Van guards ... ... 15 |
| Porters... ... ... 137 | Shoeblacks ... ... 2 | Veterinary surgeon ... 1 |
| Post-office servants ... 15 | Shopmen ... ... 33 | |
| Printers ... ... 47 | Silversmiths ... ... 2 | |
| | Soap maker ... ... 1 | |
| | Soldiers ... ... 2 | |
| | Stablemen ... ... 14 | |
| | Stamper ... ... 1 | |
| | Stationers ... ... 3 | Watchmakers ... ... 6 |
| Quarryman ... ... 1 | Stevedore ... ... 1 | Waiters ... ... 17 |
| | Stewards ... ... 2 | Warehousemen ... 7 |
| | Stokers... ... ... 4 | Weaver ... ... 1 |
| | Students ... ... 12 | Wharfingers ... ... 2 |
| | Surgical instrument maker ... ... 1 | Wheelwrights... ... 4 |
| | | Wig maker ... ... 1 |
| Rag sorter ... ... 1 | Surgeon ... ... 1 | Wood cutters ... ... 2 |
| Railway servants ... 26 | Sweeps... ... ... 12 | Writer ... ... ... 1 |

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# OCCUPATIONS OF FEMALE PATIENTS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Artificial florists | ... | 18 | Florists | ... | 18 | Paper-bag makers | ... | 4 |
| | | | French polishers | ... | 13 | Paper maker | ... | 1 |
| | | | Fruit gatherer | ... | 1 | Paper wrapper | ... | 1 |
| | | | Fur workers | ... | 12 | Photographer | ... | 1 |
| | | | | | | Pipe maker | ... | 1 |
| Bag maker | ... | 1 | | | | Polisher | ... | 1 |
| Barmaids | ... | 12 | | | | Post Office servants | ... | 4 |
| Booksewers | ... | 3 | | | | Printer | ... | 1 |
| Bookfolders | ... | 14 | | | | | | |
| Bookkeepers | ... | 2 | Gilder | ... | 1 | | | |
| Bottle washer | ... | 1 | Goldbeater skin makers | | 4 | | | |
| Bow makers | ... | 2 | Governesses | ... | 12 | | | |
| Box makers | ... | 15 | Greengrocers | ... | 3 | | | |
| Brace makers | ... | 3 | | | | Sack maker | ... | 1 |
| Brush makers | ... | 4 | | | | School girls | ... | 377 |
| Butcher | ... | 1 | | | | Scrubber | ... | 1 |
| | | | | | | Servants | ... | 179 |
| | | | Hawkers | ... | 4 | Shop women | ... | 22 |
| | | | Housekeepers | ... | 5 | Stamper | ... | 1 |
| | | | Housewives | ... | 640 | Student | ... | 1 |
| Caretakers | ... | 4 | | | | Superintendent | ... | 1 |
| Charwomen | ... | 33 | | | | Surgical instrument maker | ... | 1 |
| Cigar makers | ... | 2 | | | | | | |
| Clerks | ... | 8 | | | | | | |
| Collar maker | ... | 1 | Ironers | ... | 2 | | | |
| Confectioner | ... | 1 | | | | | | |
| Cooks | ... | 36 | | | | | | |
| | | | | | | Tailoresses | ... | 19 |
| | | | Laundresses | ... | 36 | Tea weigher | ... | 1 |
| | | | Leather worker | ... | 1 | Teachers | ... | 12 |
| Drapers | ... | 2 | | | | Tie makers | ... | 4 |
| Dress makers | ... | 42 | | | | Trimmer | ... | 1 |
| | | | Machinists | ... | 31 | | | |
| | | | Mantle makers | ... | 14 | | | |
| Embroideress | ... | 1 | Match makers | ... | 5 | Upholsteress | ... | 1 |
| Envelope makers | ... | 3 | Midwife | ... | 1 | | | |
| | | | Monthly nurses | ... | 2 | | | |
| | | | | | | Waitresses | ... | 4 |
| Factory girls | ... | 21 | | | | Weaver | ... | 1 |
| Feather workers | ... | 13 | Needlewomen | ... | 20 | Ward maids | ... | 25 |
| Fish curer | ... | 1 | Nurses | ... | 62 | Wood tyer | ... | 1 |

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# MEDICAL REPORT.

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# PREFACE TO THE APPENDICES (MEDICAL TABLES).

The abbreviations used in these Appendices are as follows :—

(1) The letters M or F with an Arabic numeral following indicate the sex and age of the patient.

(2) References to the clinical reports are made as follows :—the name of a ward indicates the ward-book for the year (1891), while the Arabic numeral following indicates the number therein of the report in question.

[NOTE.—Owing to the closing of the wings for alterations, &c., the several physicians have frequently been unable to occupy their usual wards, but in binding and indexing the notes, the names of the wards usually occupied by them have been adhered to. Thus (with the exception of cases in Radcliffe and Casualty, which are indexed under those names)

All Dr. Andrew's cases are indexed under Mark (males), and Hope (females).

| | | | | | |
|---|---|---|---|---|---|
| Dr. Church's | „ | „ | Matthew | „ | Faith „ |
| Dr. Gee's | „ | „ | Luke | „ | Mary „ |
| Sir Dyce Duckworth's | „ | | John | „ | Elizabeth „ |

(3) References to the post-mortem reports are marked P.M. The post-mortem register for the year (1891) is volume xviii. The Arabic numeral following indicates the page in this volume where the case in question is entered.

EXAMPLE.—M. 65 (Matthew 202, P.M. 225), means Male, age 65 years, clinical report in Matthew Ward-book for 1891, number 202 in that book; post-mortem report in volume xviii. of medical post-mortem registers at page 225.

The ward-books (bound volumes of clinical reports) are kept in the Library; the completed post-mortem registers in the room belonging to the Curator of the Museum.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **GENERAL DISEASES,** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fever ... ... ... | 14 | 8 | 6 | ... | ... | ... | 1 | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | 4 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Measles ... ... ... | 28 | 9 | 12 | 5 | 2 | 7 | 7 | 5 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Whooping Cough ... ... | 10 | 4 | 3 | 3 | ... | 3 | 1 | 3 | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Scarlet Fever ... ... | 9 | 3 | 6 | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | 2 | ... | ... | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Typhoid Fever ... ... | 107 | 58 | 40 | 5 | 4 | 1 | 1 | ... | ... | 5 | 6 | 1 | 3 | 8 | 10 | 1 | ... | 23 | 5 | 1 | ... | 16 | 14 | 1 | 1 | 3 | 2 | ... | ... | 2 | 2 | ... | ... | ... | 1 | ... | ... | ... | ... |
| Diphtheria ... .. ... | 67 | 12 | 19 | 13 | 23 | 5 | 2 | 9 | 16 | 3 | 1 | 2 | 6 | ... | 1 | ... | ... | ... | 1 | 1 | ... | 4 | 11 | 1 | ... | ... | 3 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Influenza ... ... ... | 30 | 15 | 14 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 | 1 | ... | ... | 7 | 6 | ... | ... | 3 | 6 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... |
| Glanders ... ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| Ague ... ... ... ... | 4 | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dysentery ... .. ... | 2 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pyæmia ... ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... ... ... | 273 | 114 | 100 | 28 | 31 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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## APPENDIX TO GENERAL DISEASES A.

*Measles.*—M 2 (Mary 185, P.M. 370), complicated with diphtheria.

*Whooping Cough.*—M 2 (Luke 19, P.M. 23); death with convulsions and hyperpyrexia; no cerebral lesion found post-mortem.

*Typhoid Fever.*—Of the nine fatal cases six were examined post-mortem, all of these had perforation. Among other (non-fatal) cases relapses are noted in five instances; one case (M 26, Luke 304) began with an epileptiform attack; one (F 22, Mary 132), had a scarlatiform eruption; one (M 6, Mark 6) was admitted for pneumonia, and proved to be typhoid; one (M 22, Mark 185) a severe case, with hyperpyrexia, was followed by ulnar neuritis; retention of urine is noted in two cases.

*Diphtheria.*—Tracheotomy in thirty cases; of these twenty proved fatal within a short time; one died after healing of the wound from acute inflammation of the trachea and bronchi, vomit was found in the air-passages (F 3, Radcliffe 49, P.M. 321); one left the hospital still wearing a tube (M 7, John 77); eight permanently recovered.

*Influenza.*—F 34 (Elizabeth 194), complicated by insanity; M 31 (Mark 131), death from pneumonia.

*Glanders.*—M 65 (Matthew 202, P.M. 225), a cab driver.

*Dysentery.*—F 25 (Mary 78, P.M. 138), admitted for chronic dysentery, died of exhaustion after influenza.

*Pyæmia.*—F 31 (Hope 166, P.M. 361), pneumonia right lung, abscess and pleurisy left lung. two or three weeks after a confinement.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **GENERAL DISEASES, B.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rheumatic Fever ... ... | 71 | 34 | 36 | 1 | ... | ... | ... | ... | ... | 3 | ... | 1 | ... | 6 | 7 | ... | ... | 6 | 11 | ... | ... | 14 | 12 | ... | ... | 4 | 4 | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Rheumatism ... ... | 34 | 18 | 16 | ... | ... | ... | 1 | ... | ... | 2 | 1 | ... | ... | 4 | ... | ... | ... | 4 | 3 | ... | ... | 5 | 6 | ... | ... | 1 | 4 | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gonorrhœal Rheumatism ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Arthritis ... ... ... | 4 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| Gout ... ... ... ... | 11 | 10 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | 1 | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... |
| Syphilis ... ... ... | 2 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Rickets ... ... ... | 5 | 3 | 2 | ... | ... | 2 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Struma ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tuberculosis ... ... | 10 | ... | ... | 8 | 2 | ... | ... | 3 | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Actino-mycosis ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Marasmus ... ... ... | 2 | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Obesity ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Anæmia ... ... ... | 35 | 1 | 34 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 15 | ... | ... | ... | 17 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Debility ... ... ... | 9 | 2 | 7 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Prœmaturity ... ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| GENERAL DISEASES, B. (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Anasarca ... ... ... | 3 | 1 | 2 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | 1 | | | |
| Paupertas ... ... ... | 1 | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Myxœdema ... ... ... | 3 | ... | 2 | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | 1 | | |
| Graves' Disease ... ... | 6 | 1 | 4 | ... | 1 | | | | | | | | | | | | | 2 | | | | 1 | 1 | | 1 | | | | | 1 | | | | | | | | | |
| Purpura ... ... ... | 5 | ... | 3 | 1 | 1 | | | | | | 1 | | | 1 | 1 | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| Lymphadenoma ... ... | 4 | 2 | ... | 2 | ... | | | | | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | 1 | | | | | | | | |
| Leukhæmia ... ... ... | 4 | 2 | 2 | ... | ... | | | 1 | | | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | 1 | | | | | |
| Enlarged Spleen ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Addison's Disease... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Total ... ... ... | 218 | 80 | 117 | 13 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## APPENDIX TO GENERAL DISEASES B.

*Rheumatic Fever.*—The one fatal case, M 7 (Luke 235, P.M. 284), had pericarditis, pleurisy of right side, and collapse of the bases of both lungs. Pericarditis was noticed in 8 (other) cases; pleurisy in one; pneumonia in two; chorea in one; heart disease of various forms in 29.

*Rheumatism.*—Pericarditis twice; pleurisy and nephritis once; heart disease five times; dementia as a sequela once, M 46 (Luke 54).

*Gout.*—In a boy of 18, M 18 (Luke 60).

*Syphilis.*—F 35 (Casualty, P.M. 261), syphilis, empyæma, lardaceous disease.

*Actino-mycosis.*—M 53, P.M. 15, had peritonitis and an obscure disease of the liver and spleen, which proved microscopically to be actino-mycosis.

*Anæmia.*—F 15 (Elizabeth 269) had also myxœdema.

*Myxœdema.*—References—F 49 (Elizabeth 305); F 56 (Elizabeth 112), had also gout and nephritis, right hemiplegia, and pneumonia; F 56 (Elizabeth 66 and 106, P.M. 56).

*Graves' Disease.*—The fatal case, F 26 (Faith 132, P.M. 227), had in addition to the ordinary symptoms much brown pigmentation of skin and severe vomiting, and died suddenly.

*Purpura.*—M 11 (Luke 181, P.M. 228) had transitory enlargement of the spleen and lymphatic glands; the left kidney also was found to be cystic and contained a stone.

*Lymphadenoma.*—References—M 37 (John 165); M 25 (Luke 110); M 13 (John 61, P.M. 98); M 44 (John 161, P.M. 336).



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## TABLE I. (*continued*).

| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **LOCAL DISEASES.** **DISEASES OF THE NERVOUS SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hemiplegia ... ... ... | 17 | 9 | 7 | ... | 1 | | | | | | | | | | | | | | 1 | | | | | | | 2 | 1 | | | 3 | | | | 2 | 3 | | | 2 | 2 | | 1 |
| Cerebral Hæmorrhage ... | 12 | 1 | 2 | 7 | 2 | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | | | | | 1 | | | | 2 | | | 1 | 3 | 2 |
| Cerebral Softening... ... | 3 | ... | ... | 3 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 2 | |
| Cerebral Syphilis ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | | |
| Cerebral Abscess ... ... | 3 | ... | ... | 1 | 2 | | | | | | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| Cerebral Tumour ... ... | 12 | 6 | 3 | 2 | 1 | | | 1 | | 2 | | | 1 | | | | | 1 | 3 | 1 | | 1 | | | | 2 | | | | | | | | | | | | | | |
| Cerebral Sclerosis ... .. | 1 | ... | 1 | ... | ... | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydro-cephalus ... ... | 2 | 1 | ... | 1 | ... | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |
| Cerebral irritation ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| Cerebral disease of uncertain nature ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Meningitis ... ... ... | 4 | ... | 2 | 1 | 1 | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Basal Meningitis ... ... | 3 | 1 | 1 | ... | 1 | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tubercular Meningitis ... | 16 | ... | ... | 12 | 4 | | | 6 | 2 | | | 3 | 1 | | | 2 | | | | 1 | | | | | | | 1 | | | | | | | | | | | | |
| Cerebro-spinal Meningitis... | 5 | ... | ... | 2 | 3 | | | | 3 | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | |
| Spinal Meningitis ... ... | 1 | ... | 1 | ... | ... | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Myelitis ... ... ... | 6 | 4 | ... | 1 | 1 | | | | | | | | | | | | | | | | | 1 | | | | 3 | | | 1 | | 1 | | | | | | | | |
| Meningo-myelitis ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Syphilis of Cord ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | |
| Uncertain Spinal disease ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE NERVOUS SYSTEM (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Caries of Vertebræ ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Cancer of Vertebræ ... | 2 | ... | ... | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | |
| Paraplegia ... ... ... | 6 | 5 | 1 | ... | ... | 1 | | | | | | | | | | | | | | | | 3 | 1 | | | | | | | 1 | | | | | | | | |
| Locomotor Ataxy ... ... | 6 | 5 | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 4 | 1 | | | | | | | |
| Disseminated Sclerosis ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Muscular Atrophy ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | |
| Amyotrophic lateral Sclerosis... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Pseudo-hypertrophic Paralysis ... ... ... | 2 | 2 | ... | ... | ... | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Landry's Disease ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Multiple Neuritis ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | |
| Diphtheritic Paralysis ... | 3 | 1 | 1 | ... | 1 | 1 | | | | | | | 1 | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Diver's Paralysis ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Lightning stroke ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Otitis ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Optic Neuritis ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Optic Atrophy ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| Facial Paralysis ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| Sciatica ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Tremors ... ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE NERVOUS SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epilepsy ... ... ... | 18 | 13 | 5 | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | 2 | ... | ... | 1 | ... | ... | ... | 3 | 1 | ... | ... | 4 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | 1 | ... | ... |
| Convulsions ... ... ... | 12 | 9 | 2 | 1 | ... | 4 | ... | 1 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Chorea ... ... ... | 33 | 4 | 28 | ... | 1 | ... | ... | ... | ... | 2 | 8 | ... | ... | ... | 17 | ... | 1 | 2 | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hemichorea ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Blepharo-spasm ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Vertigo ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Headache ... ... ... | 5 | 3 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Neuralgia ... ... ... | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... |
| Hysteria ... ... ... | 8 | ... | 8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Aphonia ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hypochondriasis ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Neurasthenia ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Coma ... ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Idiocy ... ... ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Insanity ... ... ... | 4 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| General Paralysis ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... |
| Total ... ... ... | 225 | 87 | 85 | 33 | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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## APPENDIX TO DISEASES OF NERVOUS SYSTEM.

*Hemiplegia.*—F 60 (Hope 104), slight right hemiplegia on admission, got gradually worse and died, no P.M.; M 31 (John 70), had also fits and double optic atrophy; M 60 (Luke 285), right hemiplegia, apparently unable to protrude tongue; M 44 (Mark 77), had ankle-clonus two days after onset, but recovered completely.

*Cerebral Hæmorrhage.*—M 25 (Matthew 111), secondary to fracture of skull; M 67 (Mark, P.M. 195), from an aneurism of the right middle cerebral about an inch from its origin; M 52 (Mark 61, P.M. 71), the blood had broken into the subdural space apparently through the cerebral tissues; M 62 (Matthew 90, P.M. 149), had intestinal hæmorrhage during life; a peculiar patchy thickening and ecchymosis of the mucous membrane of the lower bowel was found post-mortem.

*Cerebral Softening.*—M 46 (Luke 266, P.M. 301), during life had right hemiplegia, with inability at times to protrude tongue, post-mortem there was thrombosis of left middle cerebral artery.

*Cerebral Syphilis.*—M 35 (Luke 130), double ptosis (+ left), paralysis of both external recti, paresis right arm and leg and left leg.

*Cerebral Abscess.*—M 33 (Mark 64, P.M. 77), two abscesses, one in upper part of right rolandic region, one in posterior part of left paracentral lobule, secondary to bronchiectasis; F 14 (Faith 185, P.M. 277), admitted with diarrhœa of doubtful nature (March 6), subsequently right empyæma developed and was treated, then cutaneous abscesses, and dulness at base of left lung; post-mortem left empyæma was found and a diffuse abscess of the left posterior cerebral lobe, with much basic meningitis; F 28 (Mary 183), otitis, trephining of mastoid, transferred to surgical side, where she died.

*Cerebral Tumour.*—Post-mortems in three cases, viz.: M 3 (Hope 35, P.M. 41), tubercular tumour of pons; F 6 (Mary 26, P.M. 57), infiltrating glioma of pons; M 19 (Mark 244, P.M. 309), fibro-sarcoma involving base of brain, with chronic basic meningitis, and small tumours of the convexity eroding and nearly perforating the skull-cap.

*Hydrocephalus.*—M 32 (Mark 133, P.M. 162), symptoms during life (including double optic neuritis) suggested cerebral tumour, post-mortem extreme internal hydrocephalus, ceasing abruptly about half-way down the sylvian aqueduct, without other gross lesion.

*Tubercular Meningitis.*—M 36 (John 125, P.M. 258), admitted with symptoms of subacute rheumatism, following influenza, while in hospital severe cerebral symptoms developed and proved fatal; M 11 (John 104, P.M. 334), was three times in hospital, the symptoms pointed to cerebral tumour, and so far ameliorated as to warrant his discharge. At the time of his death (Nov. 21st), he had been

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nearly five months under observation, and his symptoms were of eight months' duration. Post-mortem, excepting some adhesions in the anterior part of the longitudinal fissure, the appearances were those of typical tubercular meningitis.

*Cerebro-Spinal Meningitis.*—References to cases examined post-mortem—M 27 (Mark 53, P.M. 58); M 40 (Mark 2, P.M. 10); F 3 (Elizabeth 290, P.M. 352); F six months (Hope 26, P.M. 59).

*Spinal Meningitis.*—F 1¼ year (Faith 205), in hospital five months, improved but did not recover.

*Myelitis.*—References to the two fatal cases as follows—M 46 (Mark 3, P.M. 3), chronic transverse myelitis of dorsal region, with ascending and descending secondary degenerations; F 30 (Elizabeth 313), subacute myelitis; symptoms at first suggesting hysterical paralysis, then bedsores, fever, death; post-mortem refused. References to the other three cases are—M 28 (Luke 308); M 32 (Luke 144); M 36 (Luke 142); M 38 (Matthew 88), the last being a case of considerable interest.

*Cancer of Vertebræ.*—M 34 (Luke 320, P.M. 348), admitted with cervico-brachial neuralgia, atrophic bilateral upper arm paralysis, and a pulsating tumour on front of chest, subsequently paraplegia, and development of other tumours; post-mortem new growth of fifth cervical vertebra, of dorsal region of spinal column, of anterior chest wall, of head of pancreas; F 37 (Elizabeth 192, P.M. 30), had cancer of the breast (recurrent after removal two years previously), of the lungs, liver, and of the dorsal vertebræ, with acute softening of the cord in the dorsal region.

*Muscular Atrophy.*—M 43 (Matthew 103), atrophy upper limbs, excessive tendon reactions in lower, perhaps amyotrophic lateral sclerosis; F 42 (Mary 158), of uncertain nature, chronic, affecting legs, with tremors of right upper limb.

*Amyotrophic Lateral Sclerosis.*—F 28 (Mary 15), typical case, three years' duration, general atrophy, bulbar symptoms.

*Landry's Disease.*—M 20 (Luke 248, P.M. 382), a typical case, apparently originating in a chill contracted in a swimming race.

*Multiple Neuritis.*—M 42 (Luke 310), following a febrile attack of uncertain nature.

*Diver's Paralysis.*—M 36 (Luke 82).

*Facial Paralysis.*—F 33 (Mary 128), bilateral.

*Sciatica.*—F 35 (Luke 84), bilateral.

*Chorea.*—Fatal case, F 13 (Faith 106, P.M.), died after temperature of 106°.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| **DISEASES OF THE CIRCULATORY SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart Disease ... ... | 26 | 11 | 11 | ... | 4 | ... | ... | ... | ... | 1 | 1 | ... | ... | 2 | ... | ... | ... | ... | 2 | ... | ... | 1 | 4 | ... | ... | 2 | 1 | ... | ... | 3 | 1 | ... | 1 | ... | 1 | ... | 2 | 2 | 1 | ... | 1 |
| Congenital Heart Disease... | 5 | 2 | 2 | ... | 1 | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dilated Heart ... ... | 6 | 4 | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... |
| Fatty Heart... ... ... | 2 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Ulcerative Endocarditis ... | 5 | ... | ... | 4 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mitral Disease ... ... | 43 | 11 | 18 | 3 | 11 | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | 1 | ... | 1 | 3 | 1 | 1 | ... | 1 | 6 | 1 | ... | 3 | 2 | ... | 1 | 1 | 4 | 1 | 4 | ... | 2 | ... | 4 | 1 | 2 | ... | ... |
| Aortic Disease ... ... | 32 | 17 | 5 | 8 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | 1 | 1 | ... | 5 | 2 | 3 | 1 | 5 | 2 | 2 | 1 | 3 | ... | 1 | ... | ... | ... | ... |
| Aortic and Mitral ... ... | 11 | 3 | 3 | 2 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | 1 | ... | 2 | ... | ... | 2 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Mitral and Tricuspid ... | 3 | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Mitral, Tricuspid, and Aortic | 5 | ... | ... | 4 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... |
| Pericarditis ... ... ... | 11 | 4 | 3 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | 2 | 2 | ... | ... | 1 | ... | 2 | ... | ... | 1 | ... | ... | ... | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tachycardia ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Aneurism ... ... ... | 20 | 10 | 2 | 8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 2 | ... | 7 | ... | 4 | 1 | 1 | ... | 4 | ... | ... | ... | ... | ... | ... |
| Atheroma ... ... ... | 2 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... |
| Venous Thrombosis ... | 10 | 2 | 8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 4 | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Venous Obstruction ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... ... ... | 183 | 68 | 52 | 33 | 30 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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## APPENDIX TO DISEASES OF CIRCULATORY SYSTEM.

*Heart Disease.*—The particular form not being specified.

*Congenital Heart Disease.*—F 33 (Hope 175, P.M. 180) communication between aortic and pulmonary artery at site of ductus arteriosus, atheroma of pulmonary arteries and aorta, embolism of left sylvian artery, of spleen and kidneys.

*Ulcerative Endocarditis.*—M 28 (John 95, P.M. 200), affecting right heart, had also consolidation of both lungs, with abscess in one lung, and cerebro-spinal meningitis; M 22 (Matthew 35, P.M. 51), admitted with pneumonia, next a cardiac murmur developed, then a petechial rash, then left hemiplegia, post-mortem large vegetations on mitral and aortic valves, plugging of left sylvian artery, infarcts of spleen and kidneys; M 32 (Mark 263, P.M. 327), old and recent valvular disease, plugging of right anterior tibial artery. Other references are—M 37 (Mark 107, P.M. 132); F. 19 (Faith 82, P.M. 97).

*Mitral Disease.*—Mitral stenosis noted in 15 cases, of which six were males, nine were females; six of these cases of mitral stenosis were fatal. In F 52 (Elizabeth 83, P.M. 125), in whom an abdominal tumour was noted during life, there was found post-mortem a gangrenous condition of the small intestine, probably depending upon new growth. M 41 (Matthew 60, P.M. 78) died from cerebral hæmorrhage; F 32 (Elizabeth 103, P.M. 131), rheumatism, erythema, mitral disease, case published by Sir Dyce Duckworth in the reports for 1891.

*Aortic Disease.*—M 8 (Mark 256, P.M. 256), aortic stenosis, only two aortic cusps existed; M 39 (Luke 225, P.M. 306), exhibited also a remarkable anomaly of the genito-urinary tract, probably a persistent Müllerian duct.

*Mitral and Aortic.*—M 12 (Matthew 165, P.M. 260), acute endocarditis (rheumatic) of five days' duration, with pericarditis; F 22 (Faith 183, P.M. 330), old valvular disease with recent vegetative endocarditis.

*Mitral and Tricuspid.*—References—F 20 (Hope 21, P.M. 28); F 23 (Hope 158, P.M. 353); F 47 (Faith 211, P.M. 343).

*Mitral, Aortic, and Tricuspid.*—References—F 30 (Elizabeth 285, P.M. 351); M 23 (Matthew 114, P.M. 159); M 46 (Luke 52, P.M. 64); M 53 (Matthew 86, P.M. 116); M 55 (Mark 63, P.M. 75).

*Pericarditis.*—M 36 (Mark 69), also pleurisy, pulmonary congestion and peritonitis; M 14 (John 128), developed typhoid in hospital; M 31 (Mark 32, P.M. 34), acute pericarditis with effusion, acute right pleurisy; F 5 (Hope 145, P.M. 275), pericarditis with effusion, double pleural effusion, paracentesis pericardii attempted; F 9 (Faith 27, P.M. 39), had also chorea.

*Aneurism.*—References to cases examined post-mortem—M 33 (Luke 172, P.M. 221), of ascending and transverse parts of arch, septic pneumonia; M 37 (John 25, P.M. 21), of ascending part of arch, rupture into left pleura; M 31 (Luke 34, P.M. 34), of ascending part of arch, ulceration between left bronchus and œsophagus, stomach full of blood; M 38 (Matthew 26, P.M. 33), of descending part of arch, eroding posterior wall of left bronchus, plugging it with clot, and finally rupturing into it; M 45 (Mark 154, P.M. 190), of descending thoracic aorta, rupturing into left bronchus, right lung in fibroid condition, also aneurism of abdominal aorta, involving cœliac axis; M 35 (John 64, P.M. 135), of abdominal aorta near cœliac axis, rupture into peritoneum; M 39 (Matthew 67, P.M. 93), of axillary and innominate, injection of perchloride of iron, thrombosis of cerebral and other arteries followed.

*Venous Thrombosis.*—F 17 (Elizabeth 96), after typhoid.

*Venous Obstruction.*—M 19 (Mark 261), partial obstruction to both venæ cavæ.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE RESPIRATORY SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Catarrh ... ... ... | 13 | 11 | 1 | ... | 1 | 3 | ... | ... | 1 | 2 | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Croup ... ... ... | 8 | 4 | 4 | ... | ... | 3 | 4 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Laryngitis ... ... ... | 14 | 7 | 6 | 1 | ... | 2 | 4 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 2 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Disease of Laryngeal Cartilages ... ... ... | 3 | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Laryngeal Palsy ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Syphilis of Larynx... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Old Tracheotomy ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Bronchitis ... ... ... | 59 | 28 | 18 | 10 | 3 | 6 | 4 | 7 | 1 | 3 | 1 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 5 | ... | 1 | 1 | 5 | 7 | ... | 1 | 3 | 3 | 1 | ... | 2 | 1 | 1 | ... | 2 | 2 | ... | ... |
| Emphysema... ... ... | 35 | 11 | 11 | 8 | 5 | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | 2 | ... | 1 | 1 | ... | ... | 5 | 3 | 1 | 2 | 3 | 3 | 1 | 1 | 1 | 3 | 1 | 2 |
| Bronchiectasis ... ... | 2 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pneumonia ... ... ... | 203 | 115 | 45 | 36 | 7 | 17 | 15 | 1 | ... | 26 | 13 | ... | ... | 8 | 8 | ... | 1 | 12 | 3 | 2 | ... | 25 | 3 | 11 | ... | 15 | 3 | 11 | 1 | 8 | ... | 6 | 2 | 4 | ... | 3 | 1 | ... | 2 | 2 |
| Broncho-Pneumonia ... | 31 | 10 | 9 | 4 | 8 | 8 | 7 | 4 | 8 | 1 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Congestion of Lungs ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Collapse of Lungs ... ... | 7 | 3 | ... | 2 | 2 | 1 | ... | 2 | 2 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Consolidation of Lungs ... | 3 | 3 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Excavation of Lung ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Intra-thoracic Tumour ... | 4 | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| Phthisis ... ... ... | 58 | 15 | 12 | 27 | 4 | 1 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | 1 | 3 | ... | 5 | 3 | 4 | 3 | 4 | 7 | 9 | ... | 2 | ... | 6 | ... | 1 | 1 | 3 | 1 | ... | 2 | ... |
| Pleurisy ... ... ... | 27 | 12 | 13 | 2 | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | 4 | 2 | 1 | ... | 2 | 3 | ... | ... | 2 | 2 | 1 | ... | 3 | 1 | ... | ... | ... | ... | ... |
| Pleural Effusion ... ... | 53 | 36 | 16 | 1 | ... | ... | ... | ... | ... | 4 | 2 | ... | ... | 3 | 3 | ... | ... | 3 | 1 | ... | ... | 9 | 4 | ... | ... | 9 | 4 | ... | ... | 6 | 1 | 1 | ... | 2 | 1 | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| DISEASES OF THE RESPIRATORY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Empyæma ... ... ... | 32 | 24 | 3 | 3 | 2 | 7 | ... | ... | 2 | 4 | 1 | ... | ... | 1 | ... | ... | ... | 6 | 1 | 1 | ... | 4 | 1 | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pneumothorax ... ... | 4 | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hæmoptysis... ... ... | 5 | 3 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | 1 | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Pleurodynia... .. ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Total ... ... ... | 369 | 292 | 142 | 101 | 34 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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## APPENDIX TO DISEASES OF RESPIRATORY SYSTEM.

*Laryngitis.*—M 35 (Matthew 172), tubercular; F 4 (Mary 62), admitted May, 1890, tracheotomy for laryngitis after scarlet fever, the tube could not be removed; November, 1890, tube having been removed, wound healed, but dyspnœa set in, necessitating replacement of tube; February, 1891, measles; March, 1891, discharged still wearing tube.

*Disease of Laryngeal Cartilages.*—M 59 (Mark 162, P.M. 196), ulceration of thyroid, œdema of larynx, cirrhosis of liver; M 39 (Luke 76, P.M. 90), necrosis of arytænoids, tracheotomy, tracheo-bronchitis, pneumonia, chronic nephritis; F 46 (Elizabeth 248), necrosis of arytænoids and œdema of larynx, also stenosis of trachea, probably syphilitic.

*Laryngeal Palsy.*—M 20 (Mark 55), abductor paralysis, chronic pulmonary degeneration.

*Bronchitis.*—M 49 (Luke 108, P.M. 170), tuberculosis of pleura and lung; M 58 (Luke 105), died after influenza.

*Emphysema.*—Including many cases of chronic bronchitis, the youngest cases as follows:—M 12 months (Elizabeth 225, P.M. 289); M 7 months (Faith 46, P.M. 83); M 5 years (Mary 30, P.M. 62); all bronchitis and emphysema.

*Bronchiectasis.*—M 34 (Luke 319, P.M. 267), bronchiectasis on right side, left lobar pneumonia; F 41 (Hope 168, P.M. 362), bronchiectasis with pneumonia on right side, cirrhosis of liver.

*Pneumonia.*—The younger cases doubtless include some cases of broncho-pneumonia. Cases that may be noted are as follows:—F 21 (Mary 100), defervescence on 6th day, relapse in same lung on 10th day, recovery; F 48 (Mary 121, P.M. 212), double apical pneumonia; M 38 (Luke 3, P.M. 6), chronic phthisis of right apex and at root of left lung, acute pneumonia of left base; M 25 (Mark 31, P.M. 32), pneumonia right apex, double pleurisy, disease of mitral aortic and tricuspid valves, history of transitory right hemiplegia just before admission, but brain was normal.

*Excavation of Lung.*—M 32 (Luke 153), winter cough 8 years, vomica diagnosed at left base, chest opened, discharge of pus through wound after 12 days.

*Intra-Thoracic Tumour.*—M 62 (Luke 187, P.M. 234), malignant disease of bronchial gland; M 24 (John 9, P.M. 184), amputation of left leg 11 months previously for sarcoma; ailing 9 weeks before admission, much dyspnœa, death a fortnight after admission, post-mortem new growth in both lungs (+ left), chiefly in centre, blocking left bronchus, projecting into trachea and pericardium; F 27 (Faith 198, P.M. 318), new growth anterior mediastinum, bronchus, lungs, heart, and breasts.

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*Phthisis.*—Complications noted as follows:—intestinal disease four times; laryngeal five times; tracheotomy for dyspnœa once; tubercular meningitis once; pneumothorax twice; renal disease four times; tubercular meningitis once; peripheral neuritis once; morbus cordis once; hydatids once; enlarged cervical glands once; purpura once; lardaceous disease once. M 36 (Matthew 108), phthisis, spinal caries, treated by tuberculine without result; M 35 (Luke, P.M. 35), appeared to begin as an acute pneumonia.

*Pleurisy.*—F 9 (Faith 96), tubercular, in a child who had been previously in the ward for tubercular peritonitis. The two fatal cases as follows:—M 41 (Luke 191, P.M. 238), pleurisy and congestion of lungs, delirium tremens; M 22 (John 49, P.M. 65), acute double pleuritis, and pericarditis, the patient being the subject of chronic tubulo-interstitial nephritis.

*Pleural Effusion.*—Probable tuberculosis twice; pneumothorax once. The fatal case as follows:—M 45 (Matthew 51, P.M. 111), right pleural effusion, pericarditis, early stage of granular kidney, old phthisis of right apex, liver described as fibroid and fatty.

*Empyæma.*—Resection of ribs noted in six cases. The fatal cases as follows:—M 16 (Matthew 33, P.M. 53), twice aspirated, afterwards four ribs resected, post-mortem old empyæma right, pleuritic effusion left, gelatinous adhesions of pericardium; F 1½ (Faith 58, P.M. 104), multiple encysted empyæmata right; F 1½ (Mary 162, P.M. 334), empyæma left, acute pericarditis, broncho-pneumonia; in the other two cases also pericarditis was found post-mortem, viz.: M 25 (John 110, P.M. 211), and M 26 (Mark 95, P.M. 138).

*Pneumothorax.*—References—M 27 (John 139); M 34 (Mark 103); F 27 (Elizabeth 142); M 17 (Luke 244, P.M. 250), in the last case phthisis pulmonum, tubercular ulcer of intestine, sago-spleen.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE DIGESTIVE SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sore Throat... ... ... | 34 | 5 | 29 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | 1 | 17 | ... | ... | 2 | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Œdema of fauces ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Stricture of Œsophagus ... | 3 | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | 1 | ... |
| Ulceration of Œsophagus ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Cancer of Œsophagus ... | 3 | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | ... |
| Gastritis ... ... ... | 4 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gastro-enteritis ... ... | 4 | 3 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dilated Stomach ... ... | 4 | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... |
| Ulcer of Stomach ... ... | 20 | 4 | 10 | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | 7 | ... | 1 | ... | 1 | ... | 1 | 3 | ... | 1 | 1 | ... | ... | 2 | ... | 1 | ... | ... |
| Cancer of Stomach... ... | 10 | 3 | 1 | 4 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | 2 | 3 | 1 | 1 | ... | ... | ... | ... |
| Enteritis ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tubercular Enteritis ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ulcer of Duodenum ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Typhlitis ... ... ... | 18 | 12 | 6 | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 2 | 2 | ... | ... | 1 | 1 | ... | ... | 5 | 2 | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Cancer of Intestine ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Intestinal Obstruction ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| Intussusception ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Imperforate Anus ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peritonitis ... ... ... | 9 | 2 | 4 | 1 | 2 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Tubercular Peritonitis ... | 7 | 1 | 4 | 1 | 1 | ... | 2 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Cancer of Omentum ... | 4 | ... | ... | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 2 | ... | ... | ... | ... |
| Cirrhosis of Liver ... ... | 24 | 12 | 2 | 5 | 5 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | 5 | ... | 1 | 1 | 3 | 1 | 4 | 2 | 2 | 1 | ... | ... | ... | ... |
| Enlarged Liver ... ... | 6 | 4 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hepatitis ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. |
| DISEASES OF THE DIGESTIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perihepatitis ... ... | 2 | ... | ... | 2 | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Abscess of Liver ... ... | 3 | 1 | ... | 2 | ... | | | | | | | | | | | | | | 1 | | | 1 | ... | 1 | | | | | | | | | | | | | | | | |
| Cancer of Liver ... ... | 6 | ... | ... | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 | | | 2 | | | | | | 1 |
| Acute Yellow Atrophy of Liver ... ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Tumour of Gall Bladder ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Gallstones ... ... ... | 4 | 1 | 2 | ... | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | 1 | | 1 | | | |
| Cancer of Pancreas ... | 2 | ... | ... | 2 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Jaundice ... ... ... | 7 | 5 | 2 | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | 2 | 1 | | | 2 | 1 | | | | | | | 1 | | |
| Ascites ... ... ... | 6 | 2 | 3 | 1 | ... | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | | | 1 | | | | | 1 | | | | | |
| Dyspepsia ... ... ... | 10 | 2 | 8 | ... | ... | 1 | | | | | | | | | | | | | | | | 3 | 5 | | | 1 | 2 | | | | 1 | | | | | | | | | |
| Gastralgia ... ... ... | 5 | 3 | 2 | ... | ... | | | | | | | | | | | | | | | | | 3 | 2 | | | | | | | | | | | | | | | | | |
| Constipation ... ... | 9 | 7 | 2 | ... | ... | | | | | | | | | | | | | | | | | 2 | 1 | | | 1 | | | | 2 | | | | | | | | 2 | 1 | |
| Diarrhœa ... ... ... | 21 | 11 | 7 | 2 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | 2 | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... |
| Vomiting ... ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | | | |
| Hæmatemesis ... ... | 12 | 7 | 5 | ... | ... | | | | | | | | | | | | | | | | | | 2 | | | 2 | 1 | | | 5 | 2 | | | | | | | | | |
| Intestinal Hæmorrhage ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Abdominal Pain ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | |
| Abdominal Tumour ... | 14 | 2 | 11 | ... | 1 | | | | | | | | | | | | | | | | | 1 | 2 | | | | 2 | | | 1 | 4 | | 1 | | 2 | | | | 1 | |
| Hydatids ... ... ... | 2 | 1 | .... | ... | 1 | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | |
| Total ... ... ... | 272 | 98 | 110 | 34 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## APPENDIX TO DISEASES OF DIGESTIVE SYSTEM.

*Stricture of Œsophagus.*—M 60 (Luke 306, P.M. 335), scarring at gastric end of œsophagus, dilatation of the tube above, atrophy of the gastric mucous membrane, general emaciation, pigmentation of skin, slight obsolete phthisis.

*Ulceration of Œsophagus.*—M 43 (Matthew 53, P.M. 254), twice in hospital, ulceration of œsophagus, stenosis and ulceration of pylorus.

*Cancer of Œsophagus.*—M 58 (Luke 171, P.M. 156), an infiltrated gland in the neck involved the left recurrent laryngeal, and caused paralysis of the left vocal cord, thereby suggesting aneurism; M 54 (Matthew 28, P.M. 38), gangrene at root of left lung, abscess between stomach and right lobe of liver; M 64 (John 93, P.M. 184), ulceration of œsophagus probably malignant, turbid effusion left pleura.

*Ulcer of Stomach.*—References to cases examined post-mortem as follows—M 53 (Luke 289, P.M. 342), three simple chronic ulcers, perforation, peritonitis; F 20 (Hope 47, P.M. 74), and F. 40 (Faith 5, P.M. 13), both admitted in collapsed state, simple perforating ulcer, peritonitis; M 48 (Luke 73, P.M. 95), simple chronic ulcer, tiny perforation with probable leakage, moderately acute peritonitis; F 30 (Elisabeth 264, P.M. 311), death two days after an attack of hæmatemesis, post-mortem an ulcer, size of split pea, with vessel running to its immediate neighbourhood, which appeared to have been opened, and then sealed again.

*Cancer of Stomach.*—References to cases examined post-mortem—M 35 (Matthew 173, P.M. 272); M 34 (John 29, P.M. 50); M 54 (Mark 137, P.M. 173); F 40 (Faith 20, P.M. 31); M 36 (Luke, P.M. 300), in this last case the growth was at the cardiac end; F 42 (Elizabeth 223, P.M. 273), stenosis of pylorus, nature somewhat doubtful.

*Ulcer of Duodenum.*—M 44 (Mark 243, P.M. 303), had opened a large pancreatic vessel.

*Cancer of Intestine.*—F 25 (Mary 187), cancer of large intestine, operation, post-mortem in surgical book; F 49 (Mary 57, P.M. 21), cancerous ulcer of ascending colon, perforation into connective tissue behind the gut.

*Intestinal Obstruction.*—F 57 (Elizabeth 245), operation, post-mortem in surgical book, simple stricture of small intestine.

*Intussusception.*—F 4 months (Faith 134), injection of air, afterwards abdominal section, fatal, no post-mortem.

*Imperforate Anus.*—F 21 (Mary 159), with malformation of sacrum and absence of coccyx.

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*Peritonitis.*—F 10 (Elizabeth 246), operation, post-mortem in surgical book, no cause found for the disease; F 31 (Martha 40, P.M. 49), peritonitis after a labour induced on account of uræmia, the patient had chronic nephritis.

*Cancer of Omentum.*—F 45 (Mary 64, P.M. 122), cancer of omentum, duodenum, gall-bladder, and right ureter; F 58 (Mary 7, P.M. 12), cancer of omentum, peritoneum, right ovary, right kidney, and simple ulcer of duodenum; F 50 (Martha, P.M. 219), new growth of peritoneum originating in ovaries.

*Cirrhosis of Liver.*—F *4 years* (Faith 135, P.M. 224); F. 28 (Mary 166, P.M. 294), with tubercular peritonitis; M 46 (Luke 305, P.M. 357), cirrhosis, perihepatitis, subdiaphragmatic abscess, and purulent peritonitis; M 37 (John 73, P.M. 144), had also spinal caries with abscess, and two tubercular tumours of brain; M 18 (John 137), "fibrosis hepatis," without history of alcohol or of syphilis.

*Perihepatitis.*—M 38 (Matthew 47, P.M. 60), perihepatitis and cirrhosis, abdomen tapped 11 times, died of intercurrent pneumonia; M 38 (Matthew 106 and 122, P.M. 359), perihepatitis with moderate cirrhosis, several times in hospital, abdomen tapped 34 times, with an average yield of 27 pints each time.

*Abscess of Liver.*—M 16 (John 92, P.M. 183), multiple abscesses, pyæmic deposits in spleen, cause undiscovered; M 28 (Luke 9, P.M. 1), two large non-communicating abscesses, ulcers of large intestine, large white kidneys.

*Cancer of Liver.*—References to cases examined post-mortem—M 43 (Luke 240, P.M. 290); F 50 (Mary 167, P.M. 356); F 51 (Faith 197, P.M. 302), this last case had also a dermoid cyst of the ovary.

*Acute Yellow Atrophy of Liver.*—F 41 (Elizabeth 233, P.M. 305).

*Tumour of Gall Bladder.*—F 60 (Hope 32, P.M. 36), growth round neck of gall-bladder, and duodenum, and behind colon, also of supra-renals.

*Gall Stones.*—F 57 (Elizabeth 181, P.M. 241), operation, post-mortem impacted gall-stones, also a beautiful specimen of two-horned uterus.

*Cancer of Pancreas.*—M 63 (John 126, P.M. 263); M 50 (Mark 259, P.M. 331).

*Abdominal Tumour.*—F 45 (Elizabeth 15, P.M. 23), large round mass in front of descending colon, enlargement of uterus.

*Hydatids.*—M 15 (Mark 14, P.M. 14), hydatids of peritoneum, forming a layer two inches thick around the abdominal viscera.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE URINARY SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Retention of urine ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | | | |
| Cystitis ... ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Nephritis ... ... ... | 22 | 13 | 6 | 3 | ... | | 2 | | | 2 | | | | | | | | 3 | | 1 | | 2 | 1 | | | 1 | | | 5 | 2 | 1 | | | | | | | 1 | |
| Acute Nephritis ... ... | 6 | 2 | 3 | 1 | ... | | | 1 | | 1 | 1 | | | | 2 | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| Chronic Nephritis ... ... | 22 | 8 | 5 | 7 | 2 | | | 2 | | | | | | | | | | 2 | | 1 | | 4 | 1 | 2 | 2 | | | | 1 | 2 | 1 | | 1 | 1 | 1 | | | 1 | |
| Chronic Interstitial Nephritis ... ... ... | 15 | 6 | 1 | 4 | 4 | | | | | 1 | | | | | | | | | | | | 1 | 1 | 1 | | | 1 | 2 | 2 | | 2 | 1 | 1 | | | | 1 | | | 1 |
| Pyelitis ... ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| Renal Calculus ... ... | 6 | 6 | ... | ... | ... | | | | | | | | | | | | | | | | | 2 | | | | 2 | | | 2 | | | | | | | | | | |
| Tubercle of Kidney ... | 2 | ... | ... | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Tumour of Kidney... ... | 1 | ... | ... | 1 | ... | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Displaced Kidney ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| Hydronephrosis ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Hæmaturia ... ... ... | 7 | 6 | 1 | ... | ... | 2 | | | | | | | | | 1 | | | 1 | | | | 1 | | | | 1 | | | 1 | | | | | | | | | | |
| Pyuria ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Polyuria ... ... ... | 1 | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diabetes ... ... ... | 15 | 9 | 3 | 3 | ... | | | | | | | | | 1 | | 1 | | | | 1 | | 3 | | | | 1 | | | 1 | 2 | 1 | | 1 | 1 | | | 2 | | | |
| Total ... ... ... | 104 | 53 | 21 | 21 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## APPENDIX TO DISEASES OF URINARY SYSTEM.

*Nephritis.*—Includes all cases where the character of the disease was not further specified, also all such headings as albuminuria, renal dropsy, Bright's disease.

*Acute Nephritis.*—M 4 (Luke 192, P.M. 244).

*Chronic Nephritis.*—Mostly parenchymatous. Reference to cases examined post-mortem as follows—M 3½ (Elizabeth 281, P.M. 346); M 4 (Faith 220, P.M. 349), pericarditis, sac-like aneurysm attached to aorta; M 17 (Matthew 74, P.M. 88), large white kidneys, serous effusions, œdema of brain; M 20 (Matthew 110, P.M. 153), large white, with perhaps some interstitial change; M 25 (Mark 283, P.M. 369), large white and slightly granular, subacute peritonitis; M 43 (John 57, P.M. 115), pale granular, chronic peritonitis, phthisis; M 58 (John 51, P.M. 89), pale granular, gout, cardio-vascular changes, hæmorrhage into pons; F 24 (Casualty 8, P.M. 147), small pale granular kidneys, with lardaceous change, old hip disease; F 28 (Elizabeth 239, P.M. 314), large white, with granular surface.

*Chronic Interstitial Nephritis.*—M 31 (John 84, P.M. 166), had only two aortic cusps; M 7 years only (Matthew 98); F 62 (Faith 171, P.M. 316), had also an ossifying sarcoma of the ilium.

*Pyelitis.*—F 54 (Mary 181, P.M. 79), distension of pelvis of kidney and peri-nephritic abscess.

*Tubercle of Kidney.*—M 30 (Luke 107, P.M. 174), tubercle of genito-urinary tract, especially of right kidney, tuberculosis of lungs; F 40 (Elizabeth 162, P.M. 210), tubercle of left kidney, fæcal abscess and fistula, general pulmonary tuberculosis.

*Tumour of Kidney.*—M 4 (Faith 77, P.M. 139), of right kidney, right ureter, lumbar glands, and liver.

*Hydro-Nephrosis.*—M 48 (Luke 264), no post-mortem.

*Hæmaturia.*—F 12 (Elizabeth 264); M 45 (Matthew 164); M 22 (Luke 71); M 4 (Mary 11), all probably paroxysmal hæmatinuria; M 18 (Matthew 166), a very obscure case.

*Diabetes.*—Fatal coma twice, viz.—M 19 (Mark 130), no post-mortem; M 43 (Luke 282, P.M. 91).

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE FEMALE GENERATIVE SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Labial Varicocele ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Urethral Caruncle ... ... | 9 | ... | 9 | ... | ... | | | | | | | | | | | | | 1 | | | | 3 | | | | 2 | | | | 1 | | | | 1 | | | | 1 | |
| Eversion of Urethra ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Vulvitis ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Epithelioma of Vulva ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Imperforate Hymen ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Absence of Vagina... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| Vaginal Cyst ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| Vaginitis ... ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| Vaginismus ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Vesico-vaginal Fistula ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Recto-vaginal Fistula ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Rectocele ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Destruction of Rectum ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Distension of Fallopian tube | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Pyosalpinx ... ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation of Uterine appendages ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Ovarian Tumour ... ... | 12 | ... | 7 | ... | 5 | | | | | | | | | | | | | | | | | 2 | ... | 1 | | 3 | ... | 1 | | | | 2 | | 1 | | | | 1 | ... 1 |
| Cervix, Catarrh of ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | |



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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE FEMALE GENERATIVE SYSTEM (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cervix, elongation of ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| Cervix, new growth of ... | 17 | ... | 17 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | 6 | | | 7 | | | | 2 | | | 1 | | | | |
| Endometritis ... ... | 4 | ... | 4 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 2 | | | | | | | | | | | |
| Uterine Fibroid ... ... | 27 | ... | 26 | ... | 1 | | | | | | | | | | | | | | | | | 1 | | | 7 | | | 16 | | 1 | | 1 | | | 1 | | | | |
| Uterine Cancer ... | 4 | ... | 4 | ... | ... | | | | | | | | | | | | | | | | | | | | 2 | | | 1 | | | | | | | 1 | | | | |
| Uterus, prolapse of... ... | 5 | ... | 5 | ... | ... | | | | | | | | | | | | | | 1 | | | 1 | | | 2 | | | 1 | | | | | | | | | | | |
| Perimetritis... ... ... | 22 | ... | 22 | ... | ... | | | | | | | | | | | | | | 2 | | | 11 | | | 7 | | | 2 | | | | | | | | | | | |
| Parametritis ... ... | 7 | ... | 7 | ... | ... | | | | | | | | | | | | | | | | | 2 | | | 4 | | | 1 | | | | | | | | | | | |
| Hæmatocele ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | |
| Dysmenorrhœa ... ... | 7 | ... | 7 | ... | ... | | | | | | | | | | | | | | | | | 5 | | | 2 | | | | | | | | | | | | | | |
| Menorrhagia ... ... | 5 | ... | 5 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | 2 | | | 2 | | | | | | | | | | | |
| Pelvic inflammation ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Pelvic pain ... ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | |
| Total ... ... ... | 128 | ... | 121 | ... | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## APPENDIX TO DISEASES OF FEMALE GENERATIVE SYSTEM.

*Absence of Vagina.*—F 25 (Martha 102) ; F 32 (Martha 246).

*Pyosalpinx.*—M 49 (Martha 95), operation, post-mortem in Surgical Book.

*Ovarian Tumour.*—For account of ovariotomies, see Surgical Tables ; F 31 (Martha 225), a dermoid cyst ; F 43 (Martha 85), sarcoma of both ovaries ; F 62 (Hope 72, P.M. 136), an ovarian cyst filling nearly whole abdomen, granular kidneys.

*Uterine Fibroid.*—The fatal case, F 44 (Martha 198, P.M. 259), was a sloughing fibroid.

*Parametritis.*—F 35 (Casualty 121), had embolism of right femoral artery.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES CONNECTED WITH PREGNANCY AND PARTURITION.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pregnancy ... ... ... | 5 | ... | 5 | ... | ... | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | |
| Retroversion of Gravid Uterus ... ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | | | | | 2 | | | | 1 | | | | | | | | | | | | | |
| Hæmorrhage during Pregnancy ... ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | |
| Hæmorrhage after Abortion | 4 | ... | 4 | ... | ... | | | | | | | | | | | | | | | | | | | | | 3 | | | | 1 | | | | | | | | | |
| Mole ... ... ... ... | 4 | ... | 3 | ... | 1 | | | | | | | | | | | | | 1 | | 1 | | | | | | 2 | | | | | | | | | | | | | |
| Abortion ... ... ... | 20 | ... | 20 | ... | ... | | | | | | | | | | | | | | | | | 9 | | | | 8 | | | | 3 | | | | | | | | | |
| Parturition ... ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | 1 | | | | 2 | | | | | | | | | | | | | | | | | |
| Placenta prævia ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Contracted Pelvis ... ... | 4 | ... | 2 | ... | 2 | | | | | | | | | | | | | | | 1 | | | | | | 2 | | 1 | | | | | | | | | | | |
| Puerperal Eclampsia ... | 2 | ... | ... | ... | 2 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | |
| Post-partum Thrombosis ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Post-partum Neurosis ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Subinvolution ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Rupture of Perinæum ... | 11 | ... | 11 | ... | ... | | | | | | | | | | | | | | | | | 8 | | | | 3 | | | | | | | | | | | | | |
| Total ... ... ... | 63 | ... | 56 | ... | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## APPENDIX TO DISEASES CONNECTED WITH PREGNANCY OR PARTURITION.

*Mole.*—F 18 (Martha 239, P.M. 360), sloughing of uterus, parametritis, &c.

*Parturition.*—F 16½ (Martha 21); F 27 (Martha 154), an impacted transverse presentation.

*Contracted Pelvis.*—F 32 (Martha 71), died from collapse following a severe instrumental labour; F 24 (Martha 247, P.M. 368), attempted delivery by forceps and version outside the Hospital, brought to the surgery by her medical attendants, where she was delivered by craniotomy, the vagina and vulva sloughed, and she died of septicæmia.

*Puerperal Eclampsia.*—F 22 (Martha 248), albuminuria, fits during and after parturition, terminating in coma and death; F 32 (Martha 197, P.M. 207), labour induced, results of post-mortem negative.

*Post-partum Thrombosis.*—F 32 (Martha 229, P.M. 110), thrombosis of femorals, iliacs, and inferior cava, of renal and ovarian veins, the clot breaking down, old parametritis, pyæmic infarcts in lungs and spleen.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE CUTANEOUS SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Erysipelas ... ... ... | 4 | 2 | 1 | 1 | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Herpes Facialis ... ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Erythema ... ... ... | 6 | ... | 6 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Psoriasis ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pityriasis Rubra ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... ... ... | 13 | 4 | 8 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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## APPENDIX TO DISEASES OF CUTANEOUS SYSTEM.

*Erysipelas.*—All except one—viz., F 6 months (Elizabeth 122)—were erysipelas of face and head. The fatal case as follows—M 36 (Casualty 33, P.M. 2), admitted in a stupid state, there was an obscure history of palsy of the limbs, died very suddenly, results of post-mortem negative.

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. |
| **POISONS.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alcoholism ... ... ... | 19 | 16 | 1 | 2 | ... | | | | | | | | | | | | | 1 | | | | 1 | | | | 8 | 1 | 2 | ... | 6 | | | | | | | | | |
| Lead ... ... ... ... | 7 | 7 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 4 | | | | 2 | | | | 1 | | | | | |
| Mercury ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Hydrochloric Acid ... ... | 2 | ... | 1 | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 |
| Sulphuric Acid ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| Carbolic Acid ... ... | 5 | 2 | 3 | ... | ... | 1 | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | 1 | | | | | | 1 | | |
| Oxalic Acid ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Coal Gas ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Coal-tar Oil ... ... ... | 1 | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| "Nine-Oils" ... ... | 1 | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opium ... ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | | | | | | | | | |
| Morphia ... ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| Belladonna ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Strychnine ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| **Total ... ... ...** | 45 | 31 | 9 | 5 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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## APPENDIX TO POISONS.

*Alcoholism*.—M 38 (Matthew 162), acute alcoholism, dilated heart, pyrexia, fatal; M 32 (Casualty 10, P.M. 168), delirium tremens, fatty liver, absence of left kidney, old quiescent phthisis.

*Hydrochloric Acid*.—The fatal case was—M 68 (Luke 30, P.M. 32).

*Sulphuric Acid*.—M 57 (John 152, P.M. 295), suicidal poisoning with mixture of sulphuric and nitric acids, had also cirrhosis of liver, old and recent tuberculosis, atheroma of aorta and pulmonary artery.

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# ABSTRACT OF TABLE I.

| DISEASES. | Total Number of Cases completed during the Year 1891. | Number of Cases discharged. | | Deaths. | | Remaining in the Hospital at the end of the year 1891. |
|---|---|---|---|---|---|---|
| | | M. | F. | M. | F. | |
| GENERAL DISEASES, A ... ... ... ... ... | 273 | 114 | 100 | 28 | 31 | |
| Do. Do. B ... ... ... ... ... | 218 | 80 | 117 | 13 | 8 | |
| LOCAL DISEASES— | | | | | | |
| Diseases of the Nervous System ... ... ... ... | 225 | 87 | 85 | 33 | 20 | |
| ,, Circulatory System ... ... ... ... | 183 | 68 | 52 | 33 | 30 | |
| ,, Respiratory System ... ... ... ... | 569 | 292 | 142 | 101 | 34 | |
| ,, Digestive System ... ... ... ... | 272 | 98 | 110 | 34 | 30 | |
| ,, Urinary System ... ... ... ... | 104 | 53 | 21 | 21 | 9 | |
| ,, Female Generative System ... ... | 128 | ... | 121 | ... | 7 | |
| Diseases connected with Pregnancy ... ... ... ... | 63 | ... | 56 | ... | 7 | |
| Diseases of the Cutaneous System ... ... ... ... | 13 | 4 | 8 | 1 | ... | |
| CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES— | | | | | | |
| POISONS ... ... ... ... ... | 45 | 31 | 9 | 5 | ... | |
| | 2,093 | 827 | 821 | 269 | 176 | 178 |
| | | 1,648 | | 445 | | |
| | | 2,093 | | | | |

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# SURGICAL REPORT.

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# TABLE I.

*Showing the Total Number of Cases under Treatment during the Year* 1891, *with the comparative Frequency and Mortality of each Disease at different Ages.*

| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **General Diseases.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Erysipelas— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cutaneous* ... ... | 14 | 6 | 7 | 1 | ... | 2 | 1 | ... | ... | 1 | ... | ... | ... | 1 | 3 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... |
| *Phlegmonous Erysipelas and Cellulitis* ... ... | 65 | 49 | 15 | 2 | ... | 1 | 2 | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 1 | 2 | ... | ... | 11 | 3 | 1 | ... | 14 | 1 | 1 | ... | 6 | 1 | ... | ... | 1 | 4 | ... | ... | 12 | 2 | ... | ... |
| Anthrax ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Delirium Tremens ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hæmophilia... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pyæmia ... ... ... | 4 | 1 | 1 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... |
| Gangrene— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Idiopathic* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Moist (from injury)* ... | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Senile* ... ... ... | 5 | 3 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | 1 | ... | 1 |
| Tuberculosis ... ... | 3 | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Parasites— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydatids— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Abdominal Wall* ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Liver* ... ... ... | 3 | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **VENEREAL DISEASES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gonorrhœa ... ... ... | 70 | 45 | 25 | ... | ... | | | | | | | | | | | | | 15 | 10 | | | 17 | 13 | | | 8 | 2 | | | 5 | | | | | | | | | | |
| Constitutional Syphilis ... | 39 | 20 | 19 | ... | ... | | | | | | | | | | | | | 2 | 4 | | | 12 | 7 | | | 4 | 5 | | | 2 | 2 | | | | 1 | | | | |
| Congenital Syphilis ... | 3 | 1 | 2 | ... | ... | | | | | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| Soft Sores ... ... ... | 16 | 11 | 5 | ... | ... | | | | | | | | | | | | | 3 | 3 | | | 7 | 2 | | | 2 | | | | 1 | | | | | | | | | |
| **TUMOURS.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epithelioma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Anus* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| *Arm* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| *Bladder* ... ... ... | 9 | 6 | ... | 3 | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 2 | | 1 | | | 4 | | 1 |
| *Buttock* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Cheek* ... ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | 1 | | |
| *Ear* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| *Floor of Mouth* ... ... | 6 | 6 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | 1 | | | 2 | | |
| *Forehead* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| *Glands of Groin* ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| *Glands of Neck* ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 2 | | |
| *Larynx* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| *Leg* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| *Lip* ... ... ... | 12 | 12 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | 3 | | | 8 | | |
| *Lip (Upper)* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| *Nose* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| *Œsophagus* ... ... | 12 | 8 | 2 | 2 | ... | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | 1 | | 1 | 2 | 1 | 4 | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| TUMOURS (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epithelioma (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Penis* ... ... ... | 5 | 5 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | 2 | | | | 1 | | | |
| *Thigh* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Tongue* ... ... ... | 18 | 13 | 1 | 3 | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | 4 | 1 | | | 3 | | 2 | | 5 | | 1 | 1 |
| *Tonsil* ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| Cystic Epithelioma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lower Jaw* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Rodent Ulcer ... ... | 12 | 7 | 4 | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | 3 | 2 | | | 3 | 1 | 1 | |
| Alveolar Carcinoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Breast* ... ... ... | 50 | 1 | 48 | ... | 1 | | | | | | | | | | | | | | | | | 1 | | | | 4 | | 17 | | 1 | | 17 | | | | 1 | 9 | | |
| *Breast* (*recurrent*) ... | 7 | ... | 7 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | 2 | | | | 2 | | | | | 2 | | |
| *Axillary Glands* ... | 7 | ... | 7 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | 4 | | | | 2 | | | | | | | |
| *Cæcum* ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| *Colon* ... ... ... | 4 | 1 | ... | ... | 3 | | | | | | | | | | | | | | | | | | | | | | | 1 | | 2 | | | | | | | | | |
| *Ilium* ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| *Liver* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| *Mesentery* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| *Prostate* ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| *Pylorus* ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | |
| *Rectum* ... ... ... | 29 | 15 | 10 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 1 | | | 3 | 2 | 2 | 1 | 8 | 5 | | 1 |
| *Sigmoid* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Thyroid* ... ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Duct Carcinoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Breast* ... ... ... | 4 | ... | 4 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 | | | | 2 | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. |
| TUMOURS (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sarcoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Endosteal— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lower Jaw* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Upper Jaw* ... ... | 6 | 1 | 4 | 1 | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | 2 | | | | 2 | 1 | | | | |
| *Tibia* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Periosteal— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur*... ... ... | 4 | 3 | 1 | ... | ... | | | | | | | | | 1 | 1 | | | 2 | | | | | | | | | | | | | | | | | | | | | |
| *Humerus* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| *Sternum* ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| *Superior Maxilla* ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arm ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Back ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Breast ... ... ... | 4 | 1 | 3 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 3 | | | | | | | | | |
| Breast (sero-cystic) ... | 4 | ... | 4 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | 2 | | | | | |
| Chest-Wall (lympho-sarcoma) ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |
| Face (Melanotic) ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Groin ... ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | 1 | | | | | |
| Hand ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney ... ... ... | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Leg ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Multiple (Melanotic) ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Muscle ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **TUMOURS (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sarcoma (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Naso-Pharynx ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | |
| Neck ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Neck (lympho-sarcoma)... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Nose ... ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | 1 | | | |
| Parotid ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Parotid (Melanotic) ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Testis ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | | |
| Testis (retained)... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Thigh ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Tonsil ... ... ... | 2 | ... | 1 | ... | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Cysts— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Blood* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| *Dental* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Dermoid* ... ... ... | 13 | 8 | 5 | ... | ... | | | | | | | | | | 1 | | | 1 | 1 | | | 6 | 2 | | | 1 | 1 | | | | | | | | | | | | |
| *Hygroma* ... ... ... | 3 | 2 | 1 | ... | ... | 1 | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| *Ovarian* ... ... ... | 9 | ... | 7 | ... | 2 | | | | | | | | | | | | | | | | | | 2 | | | | 3 | | | | 1 | | 2 | | 1 | | | | |
| *Periosteal* (*Jaw*) ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |
| *Sebaceous* ... ... ... | 6 | 5 | 1 | ... | ... | | | | | | | | | | | | | | | | | 3 | | | | 1 | | | | | 1 | | | | | | 1 | | |
| *Serous* ... ... ... | 8 | 3 | 5 | ... | ... | 1 | | | | 1 | 1 | | | | 1 | | | | | | | 1 | 3 | | | | | | | | | | | | | | | | |
| *Serous* (*Breast*) ... ... | 6 | ... | 6 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | 4 | | | | 1 | | | | |
| Abdominal Tumour ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| TUMOURS (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adenoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Palate* ... ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | 1 | | | | | | | |
| *Parotid* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Adeno-Fibroma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Breast* ... ... ... | 18 | 2 | 16 | ... | ... | | | | | | | | | | | | | | | | | 10 | | | | 5 | | | | 1 | 1 | | | 1 | | | | | |
| Enchondroma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Finger* ... ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | 2 | | | | 1 | | | | | | | | | | | | | |
| Exostosis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... ... | 3 | 2 | 1 | ... | ... | | | | | | | | | 1 | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Ilium* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Multiple* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Radius* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Skull* ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | 1 | | | | | |
| *Tibia* ... ... ... | 5 | 4 | 1 | ... | ... | | | | | | | | | 1 | 1 | | | 2 | | | | 1 | | | | | | | | | | | | | | | | | |
| *Toe* ... ... ... | 3 | 2 | 1 | ... | ... | | | | | | | | | | | | | 2 | | | | 1 | | | | | | | | | | | | | | | | | |
| Fibroma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Buttock* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Forehead* ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | | | | | | | | | |
| *Jaw Bones* ... ... | 6 | 1 | 5 | ... | ... | | | | | | | | | 1 | | | | | 1 | | | 4 | | | | | | | | | | | | | | | | | |
| *Larynx* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |

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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| TUMOURS (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibroma (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Leg* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Multiple* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tongue* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Fibro-Myoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Uterus* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Granuloma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Finger* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| *Neck* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Lipoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arm* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Axilla* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Back* ... ... ... | 2 | 1 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Buttock* ... ... ... | 3 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Chest-Wall* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Foot* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Neck* ... ... ... | 3 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Nose* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Shoulder* ... ... ... | 6 | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| Lymphoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Neck* ... ... ... | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **TUMOURS (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymphangioma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arm* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tongue* ... ... ... | 3 | 1 | 2 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Lymphangiectasis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arm* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Nævus ... ... ... | 27 | 13 | 14 | ... | ... | 5 | 12 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 5 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Neuroma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Median Nerve* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Osteoma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lower Jaw* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Polypus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ear* .. ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Nose* ... ... ... | 3 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Rectum* ... ... ... | 5 | 1 | 4 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Papilloma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Bladder* ... ... ... | 2 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 |
| *Larynx* ... ... ... | 3 | 2 | 1 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Lip* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Scrotum* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| *Vulva* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Thyroid— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Bronchocele* ... ... | 7 | 1 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |

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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **MALFORMATIONS AND DEFORMITIES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Anus Imperforate ... ... | 5 | ... | 3 | 2 | ... | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Cleft Palate ... ... ... | 16 | 11 | 5 | ... | ... | 2 | ... | ... | ... | 3 | 2 | ... | ... | 3 | 2 | ... | ... | 3 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Congenital Dislocation of Hip | 2 | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Congenital Deformity of— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Finger* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Knee* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Penis* ... ... ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Congenital Stricture of Urethra ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Deformed Chest ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Genu Valgum ... ... | 16 | 11 | 5 | ... | ... | 3 | 3 | ... | ... | 6 | 2 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Genu Varum ... ... | 5 | 4 | 1 | ... | ... | 3 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hammer Toe ... ... | 9 | 4 | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Hare-Lip ... ... ... | 13 | 10 | 3 | ... | ... | 9 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hypospadias ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Phimosis ... ... ... | 22 | 22 | ... | ... | ... | 5 | ... | ... | ... | 2 | ... | ... | ... | 4 | ... | ... | ... | 5 | ... | ... | ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Spina Bifida... ... ... | 3 | 3 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Spine— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lateral Curvature* ... | 5 | 1 | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Supernumerary Thumb ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Talipes— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cavus* ... ... ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Equinus*... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Equino-Varus* ... ... | 8 | 3 | 5 | ... | ... | ... | 3 | ... | ... | 2 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Planus* ... ... ... | 7 | 5 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | 2 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| MALFORMATIONS AND DEFORMITIES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Webbed Fingers ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | |
| Wry Neck ... ... ... | 5 | 1 | 4 | ... | ... | 1 | | | | 1 | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | |
| DISEASES OF THE NERVOUS SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Encephalocele ... ... | 1 | 1 | ... | ... | ... | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epilepsy ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Epilepsy after Head Injury | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Hydrocephalus ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Infantile Paralysis ... ... | 5 | 5 | ... | ... | ... | | | | | 2 | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | |
| Meningitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tubercular* ... ... | 1 | ... | ... | 1 | ... | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Neuralgia— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Neck* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arm* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| *Finger* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Paralysis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Facial* ... ... ... | 1 | 1 | ... | ... | ... | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Paraplegia ... ... ... | 4 | 2 | 2 | ... | ... | 1 | | | | | | | | | | | | 1 | | | | | | | | 1 | 1 | | | | | | | | | | | |
| Tabes Dorsalis ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE EYE.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conjunctiva— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Conjunctivitis* ... ... | 5 | 3 | 2 | ... | ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Granular Lids* ... ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Herpes* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Cornea and Sclerotic— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Episcleritis* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Keratitis* ... ... ... | 39 | 14 | 25 | ... | ... | 1 | 3 | ... | ... | 4 | 9 | ... | ... | 6 | 7 | ... | ... | ... | 1 | ... | ... | 1 | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | 1 | ... | ... |
| *Interstitial Keratitis* ... | 4 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Phlyctenular Keratitis*... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Corneal Ulcer* ... ... | 24 | 18 | 6 | ... | ... | 4 | 1 | ... | ... | 3 | 2 | ... | ... | 2 | 1 | ... | ... | ... | 1 | ... | ... | 4 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | 3 | ... | ... | ... |
| *Corneal Opacities* ... | 8 | 2 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| *Staphyloma* ... ... | 3 | 2 | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Iris— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Iritis* ... ... ... | 11 | 6 | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | 2 | 3 | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... |
| *Kerato-Iritis* ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Lens— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cataract* ... ... ... | 44 | 22 | 22 | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | 1 | 3 | ... | ... | 9 | ... | ... | 11 | 9 | ... | ... |
| *Anterior Polar* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Lamellar* ... ... ... | 6 | 3 | 3 | ... | ... | 2 | ... | ... | ... | ... | 2 | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Traumatic* ... ... | 7 | 7 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Opaque Capsule* ... ... | 18 | 8 | 10 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | 1 | 1 | ... | ... | 4 | ... | ... | 5 | 2 | ... | ... |
| *Aphakia* ... ... ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... |
| Retina, Optic Nerve, and Vitreous Humour— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Blind Eye* ... ... | 6 | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Detached Retina* ... | 4 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE EYE (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Retina, Optic Nerve, and Vitreous Humour (*cont.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Albuminuric Retinitis* ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Neuro-Retinitis* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Retinitis* ... ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | |
| *Intra-ocular Hæmorrhage* | 4 | 4 | ... | ... | ... | | | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | | | | | | |
| General Affections of the Eye— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Glaucoma* ... ... | 20 | 10 | 10 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 3 | 4 | | | 2 | 4 | | | 5 | 1 | | |
| *Leucoma* ... ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Choroiditis* ... ... | 2 | 2 | ... | ... | ... | 1 | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Panophthalmitis* ... | 10 | 4 | 6 | ... | ... | 1 | 2 | | | | | | | 1 | | | | 1 | | | | 3 | | | | | | | | | | | | 1 | | | | 1 | 1 | | |
| *Intra-ocular Tumour* ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| *Hyalitis* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| *Nystagmus* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Amblyopia* ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Squint— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Internal* ... ... ... | 38 | 19 | 19 | ... | ... | 4 | 4 | | | 11 | 11 | | | 4 | 2 | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *External* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Errors of Refraction— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Astigmatism* ... ... | 11 | 2 | 9 | ... | ... | | | | | | 1 | | | 2 | 3 | | | 3 | | | | 2 | | | | | | | | | | | | | | | | | |
| *Hypermetropia* ... | 5 | ... | 5 | ... | ... | | | | | | 1 | | | | 1 | | | 2 | | | | 1 | | | | | | | | | | | | | | | | | |
| *Myopia* ... ... ... | 4 | 1 | 3 | ... | ... | | | | | | | | | 1 | | | | 2 | | | | 1 | | | | | | | | | | | | | | | | | |

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## TABLE I. (*continued*).

| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE EYE (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diseases of the Lachrymal Apparatus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lachrymal Abscess* ... | 4 | 2 | 2 | ... | ... | | | | | 1 | 1 | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | |
| *Lachrymal Obstruction* .. | 2 | ... | 2 | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Diseases of the Eyelids— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ectropion* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Entropion* ... ... | 4 | 1 | 3 | ... | ... | | | | | | | | | | | | | | | | | | 2 | | | 1 | | | | 1 | | | | | | | | |
| *Dermoid Cysts* ... ... | 4 | 1 | 3 | ... | ... | | | | | | | | | 1 | | | | 1 | | | | 1 | 1 | | | | | | | | | | | | | | | |
| *Meibomian Cysts* ... | 2 | 2 | ... | ... | ... | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| *Papilloma* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Orbit— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cyst* ... ... ... | 1 | 1 | ... | ... | ... | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Nævus* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| *Sarcoma* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Ptosis ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | |
| Trichiasis ... ... ... | 3 | ... | 3 | ... | ... | | | | | | | | | | | | | | | | | | 1 | | | | | | | 2 | | | | | | | | |
| **DISEASES OF THE EAR.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Otorrhœa and Otitis ... | 18 | 11 | 5 | ... | 2 | 1 | 1 | ... | ... | 2 | ... | ... | 1 | 1 | ... | ... | 1 | 1 | ... | ... | ... | 4 | 2 | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Membrana Tympani Ruptured ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE NOSE.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epistaxis ... ... ... | 4 | 2 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Hypertrophic Catarrh ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ozœna ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Nasal Spur ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Septum Deviated ... ... | 4 | 3 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Stenosis of Nares ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **DISEASES OF THE CHEST.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Empyæma ... ... ... | 4 | 3 | 1 | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pneumonia ... ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **DISEASES OF THE LARYNX AND TRACHEA.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abductor Paralysis... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Foreign Body in Air-passage ... ... ... | 2 | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Laryngitis ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Œdema ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Old Tracheotomy ... ... | 4 | 2 | 2 | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tubercular Disease... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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## TABLE I. (*continued*).

| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE VASCULAR SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arteries— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aneurysm— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Carotid* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| *Femoral* ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | 1 | | | | | | | |
| *Popliteal* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| *Root of Neck* ... ... | 2 | 1 | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | |
| Aneurysm— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Traumatic— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Posterior Tibial* ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Veins— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phlebitis and Thrombosis — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Leg* ... ... ... | 11 | 4 | 7 | ... | ... | | | | | | | | | | | | | | 2 | | | 1 | 1 | | | 2 | | | 3 | 1 | | | 1 | | | | | | |
| Varicose Veins ... ... | 15 | 12 | 3 | ... | ... | | | | | | | | | | | | | 4 | | | | 5 | 2 | | | 2 | | | 1 | | | | 1 | | | | | | |
| DISEASES OF THE LYMPHATIC SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Glands Inflamed and Suppurating ... ... ... | 22 | 16 | 6 | ... | ... | 2 | | | | 2 | | | | 2 | 2 | | | 3 | | | | 3 | 4 | | | 2 | | | 1 | | | | | | | 1 | | | |
| Lymphatics— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymphangitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Upper Extremity* ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Lower Extremity* ... | 4 | 3 | 1 | ... | ... | | | | | | | | | 1 | | | | | | | | 1 | | | | | 1 | | | 1 | | | | | | | | | |
| Elephantiasis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Foot* ... ... ... | 1 | ... | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Leg* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE DIGESTIVE SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mouth— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cancrum Oris* ... ... | 5 | 1 | ... | ... | 4 | 1 | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Phagedæna* ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Ranula* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Stomatitis* ... ... | 4 | 1 | 3 | ... | .. | ... | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tongue— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Hæmorrhage* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| Tonsils— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Enlarged* ... ... ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Inflamed* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Salivary Glands— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Parotitis* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Parotid Fistula* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pharynx— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Adenoid Vegetations* ... | 19 | 12 | 7 | ... | ... | 2 | ... | ... | ... | 5 | 1 | ... | ... | 2 | 2 | ... | ... | 1 | 2 | ... | ... | 1 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Pharyngeal Fistula* ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Ulcer* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Œsophagus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Injured by Sword* ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Stricture* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |

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## TABLE I. (*continued*).

| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE DIGESTIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestines— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hernia— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reducible— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femoral* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Inguinal* ... ... | 14 | 14 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | 5 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| *Ventral* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Irreducible— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femoral* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| *Inguinal* ... ... | 10 | 10 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... |
| *Umbilical* ... ... | 6 | 2 | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | 2 | ... | 1 | ... |
| *Ventral* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Strangulated— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femoral* ... ... | 31 | 1 | 18 | 2 | 10 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | 2 | ... | ... | ... | 7 | 1 | 1 | ... | 5 | ... | 1 | ... | 2 | 1 | 8 |
| *Inguinal* ... ... | 19 | 19 | ... | ... | ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 4 | ... | ... | ... | 3 | ... | ... | ... |
| *Umbilical* ... ... | 2 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Inflamed Inguinal ... | 2 | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hydrocele of Hernial Sac . | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Fæcal Fistula ... ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Incontinence of Fæces ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Intestinal Obstruction ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Intussusception ... ... | 5 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peritonitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Simple* ... ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tubercular* ... ... | 2 | 1 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE DIGESTIVE SYSTEM (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestines (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Perityphlitis and Appendicitis ... ... ... | 6 | 6 | ... | ... | ... | | | | | | | | | 1 | | | | 4 | | | | 1 | | | | | | | | | | | | | | | | | |
| Rupture of Intestine ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| Rupture of Mesentery ... | 1 | ... | ... | 1 | ... | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulceration of Colon ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Volvulus ... ... ... | 1 | ... | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| Rectum and Anus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Anal Fissure* ... ... | 6 | 1 | 5 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 4 | | | | 1 | | | | | | | | | |
| *Anal Fistula* ... ... | 28 | 22 | 6 | ... | ... | | | | | | | | | 1 | | | | 1 | | | | 4 | 1 | | | 6 | 3 | | | 8 | 2 | | | 2 | | | | | |
| *Anal Prolapse* ... ... | 8 | 6 | 2 | ... | ... | 3 | | | | | | | | | | | | | | | | 1 | | | | | 1 | | | | 1 | | | | 2 | | | | | |
| *Hæmorrhoids* ... ... | 43 | 29 | 14 | ... | ... | | | | | | | | | | | | | | | | | 5 | 5 | | | 16 | 6 | | | 5 | 3 | | | 3 | | | | | |
| *Recto-Vaginal Fistula* ... | 4 | ... | 4 | ... | ... | | | | | | | | | 1 | | | | | | | | | 1 | | | | 2 | | | | | | | | | | | | |
| *Recto-Vesical Fistula* ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| *Stricture (Fibrous)* ... | 9 | 3 | 6 | ... | ... | | | | | | | | | | | | | | | | | | 2 | | | 2 | 4 | | | | | | | | | 1 | | | |
| *Ulceration of Rectum* ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| **DISEASES OF THE GENITO-URINARY ORGANS.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bladder— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Calculus* ... ... ... | 11 | 7 | 1 | 3 | ... | 1 | ... | 1 | ... | 2 | 1 | ... | ... | 1 | ... | ... | ... | | | | | | | | | 3 | ... | ... | ... | | | | | | | | | 2 | ... |
| *Cystitis* ... ... ... | 11 | 10 | 1 | ... | ... | | | | | | | | | 2 | | | | | 1 | | | 1 | | | | 1 | | | | 2 | | | | | | 5 | | | |
| *Tubercular Disease* ... | 6 | 4 | 2 | ... | ... | | | | | | | | | | | | | 1 | | | | 3 | 2 | | | | | | | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE GENITO-URINARY ORGANS (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Calculus* ... ... ... | 6 | 4 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Cystic Disease* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Floating* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Hydatid* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Renal Colic* ... ... | 6 | 1 | 4 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| *Rupture* ... ... ... | 3 | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| Penis and Prepuce— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Œdema* ... ... ... | 2 | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Paraphimosis* ... ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Prostate— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Enlarged* ... ... ... | 11 | 9 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 6 | ... | 2 | ... |
| *Inflamed* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| Scrotum— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Œdema* ... ... ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Spermatic Cord— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Encysted Hydrocele* ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Varicocele* ... ... | 12 | 12 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M | F. | M. | F. |
| DISEASES OF THE GENITO-URINARY ORGANS (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Testis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Orchitis and Epididymitis* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Syphilitic Disease* ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tubercular Disease* ... | 10 | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Tunica Vaginalis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Hæmatocele* ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Hydrocele*... ... ... | 9 | 9 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Urethra— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Calculus* ... ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Fistula* ... ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... |
| *Rupture* ... ... ... | 7 | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Stricture* ... ... ... | 71 | 65 | ... | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 9 | ... | ... | ... | 7 | ... | 1 | ... | 29 | ... | 2 | ... | 10 | ... | 1 | ... | 9 | ... | 2 | ... |
| *Traumatic Stricture* ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Ulcer* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| Urine and Urination— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Dysuria* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Extravasation* ... ... | 2 | 1 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Hæmaturia* ... ... | 5 | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Retention*... ... ... | 2 | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tuberculosis of Genito-Urinary Organs ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE GENITO-URINARY ORGANS (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Uterus and Appendages— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Retroversion* ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | | | | |
| *Parametritis* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Hydrosalpinx* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vulva— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Noma* ... ... ... | 2 | ... | ... | ... | 2 | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Vulvitis* ... ... ... | 3 | ... | 3 | ... | ... | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Vagina Occluded* ... | 1 | ... | 1 | ... | ... | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Nymphæ Hypertrophied* .. | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Perineum Ruptured* ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Breast— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hæmorrhage after— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Amputation* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| *Mastitis* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Nipple Ulcerated* ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| DISEASES OF THE ORGANS OF LOCOMOTION. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone: Diseases of— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abscess— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Head of Humerus* ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| *Head of Tibia*... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Tibia* ... ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | 1 | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE ORGANS OF LOCOMOTION (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone: Diseases of (*cont.*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Caries— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Finger* ... ... ... | 2 | 1 | 1 | ... | ... | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Head of Humerus* ... | 1 | 1 | ... | ... | ... | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Jaw* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | |
| *Mastoid* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Metatarsus* ... ... | 2 | 1 | 1 | ... | ... | | 1 | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Os Calcis* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Spine* ... ... ... | 28 | 12 | 13 | 2 | 1 | 2 | 3 | | | 2 | 7 | | | 6 | 1 | | | | | | | | 2 | 1 | 1 | 2 | | 1 | | | | | | | | | | | |
| *Tarsus* ... ... ... | 12 | 9 | 3 | ... | ... | 1 | 1 | | | 3 | | | | | 1 | | | 1 | | | | 4 | 1 | | | | | | | | | | | | | | | | |
| *Tibia* ... ... ... | 2 | 2 | ... | ... | ... | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ulna* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Necrosis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Clavicle* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *Femur* ... ... ... | 6 | 4 | 1 | ... | 1 | 1 | | | | | | | | 1 | | | | 1 | | | | | | | | 1 | 1 | | | | | | | | | | 1 | | |
| *Fibula* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Humerus* ... ... | 4 | 4 | ... | ... | ... | | | | | | | | | | | | | 2 | | | | 1 | | | | 1 | | | | | | | | | | | | | |
| *Ilium* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| *Jaw Bones* ... ... | 13 | 9 | 4 | ... | ... | | 1 | | | 2 | | | | 1 | 2 | | | | | | | | 1 | | | 2 | | | | 3 | | | | 1 | | | | | |
| *Malar* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Mastoid* ... ... | 3 | 2 | 1 | ... | ... | | | | | | 1 | | | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Metatarsus* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| *Os Calcis* ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | 1 | | |
| *Pelvis* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | M. | F. | M. | F. | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | | | | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE ORGANS OF LOCOMOTION (*cont.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone: Diseases of (*cont.*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Phalanges* ... ... | 8 | 4 | 4 | ... | ... | | | | | | | | | | | | | | | | | 3 | 2 | | | | | | | 1 | 1 | | | | 1 | | | | |
| *Rib* ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | |
| *Skull* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Tarsus* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tibia* ... ... ... | 11 | 9 | 2 | ... | ... | | | | | | 1 | | | 1 | | | | 1 | | | | | 1 | | | | 2 | | | | 5 | | | | | | | | |
| Periostitis and Osteitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Acute*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... | 1 | ... | 1 | ... | ... | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Fibula* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| *Humerus* ... ... | 1 | ... | 1 | ... | ... | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Radius* ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| *Tibia* ... ... | 5 | 3 | 2 | ... | ... | | | | | 1 | | | | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Chronic*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Femur*** ... ... | 5 | 3 | 2 | ... | ... | | | | | 1 | | | | | | | | | | | | | 1 | | | | 1 | | | | 2 | | | | | | | | |
| ***Fibula*** ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| ***Humerus*** ... ... | 3 | 1 | 2 | ... | ... | | | | | | | | | | | | | 1 | 1 | | | | 1 | | | | | | | | | | | | | | | | |
| ***Os Calcis*** ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| ***Sternum*** ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| ***Tibia*** ... ... | 5 | 2 | 3 | ... | ... | | | | | | | | | | | | | 1 | | | | 1 | 2 | | | | 1 | | | | | | | | | | | | |
| **Epiphysitis—** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Acute*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Femur*** ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE ORGANS OF LOCOMOTION (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone: Diseases of (*cont.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epiphysitis—(*cont.*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Chronic*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Radius* ... ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tibia* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Rickets ... ... ... | 6 | 3 | 3 | ... | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Old Osteotomy ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Stump— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Conical* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Contracted* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Joints— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ankylosis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ankle* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Elbow* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Finger* ... ... ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| *Hip* ... ... ... | 3 | 2 | 1 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Knee* ... ... ... | 8 | 6 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Shoulder* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Wrist* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Charcot's Disease— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Knee* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE ORGANS OF LOCOMOTION (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Joints (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chronic Strumous or Tubercular Disease— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ankle* ... ... ... | 8 | 4 | 3 | ... | 1 | 1 | ... | ... | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Elbow* ... ... ... | 10 | 8 | 2 | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Hip* ... ... ... | 60 | 32 | 25 | 2 | 1 | 3 | 3 | ... | ... | 13 | 7 | 1 | 1 | 7 | 8 | 1 | ... | 6 | 4 | ... | ... | 3 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... |
| *Knee* ... ... ... | 42 | 24 | 17 | 1 | ... | 2 | 2 | ... | ... | 3 | 5 | ... | ... | 4 | 4 | ... | ... | 4 | 4 | 1 | ... | 8 | 2 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Sacro-Iliac* ... ... | 3 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Shoulder* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tarsus* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Wrist* ... ... ... | 4 | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hysterical Disease— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ankle* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Elbow* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Hip* ... ... ... | 5 | 1 | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Knee* ... ... ... | 3 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Hydrops Articuli... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Internal Derangement— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Knee* ... ... ... | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| Loose Bodies in Joints— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Elbow* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Knee* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Foreign Body in Knee ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE ORGANS OF LOCOMOTION (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JOINTS (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Osteo-Arthritis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Elbow* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Hip* ... ... ... | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Knee* ... ... ... | 8 | 7 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... |
| *Phalanges* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Many Joints* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gonorrhœal Arthritis ... | 4 | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Sprain— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ankle* ... ... ... | 4 | 3 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Synovitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Elbow* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Knee* ... ... ... | 14 | 10 | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 5 | 4 | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Radio-Ulnar artic.* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Tarsus* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Rheumatic Synovitis ... | 5 | 2 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Syphilitic Disease— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Knee* ... ... ... | 3 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Suppurative Arthritis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Knee* ... ... ... | 3 | 2 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| *Wrist* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Old Excisions— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Hip* ... ... ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Knee* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
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| DISEASES OF THE BURSÆ, FASCIÆ, AND TENDONS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Simple Enlargement of Bursæ— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Deltoid* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Great Toe* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Over Head of Fibula* ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Hyoid* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Patellar* ... ... ... | 7 | ... | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 4 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| *Psoas* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| *Thigh* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Inflamed & Suppurating— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Olecranon* ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Patellar* ... ... | 23 | 12 | 11 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 4 | 5 | ... | ... | 2 | 2 | ... | ... | 2 | 2 | ... | ... | 1 | ... | ... | 2 | ... | ... | ... |
| Hæmorrhage into Bursa Patellæ ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dupuytren's Contraction ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ganglion (Compound)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Dorsal* ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Needle in Leg ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Muscles Torn ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| DISEASES OF THE CELLULAR TISSUE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abscess, Inflammation, and Suppuration ... ... | 315 | 170 | 139 | 5 | 1 | 31 | 15 | ... | ... | 21 | 16 | ... | ... | 19 | 11 | ... | ... | 21 | 18 | 1 | ... | 31 | 39 | ... | ... | 35 | 22 | 3 | 1 | 17 | 7 | ... | ... | 4 | 9 | 1 | ... | 1 | 2 | ... | ... |
| Œdema of Extremities ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| DISEASE. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE CUTANEOUS SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carbuncle— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Back* ... ... ... | 4 | 2 | 2 | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | 1 | | |
| *Neck* ... ... ... | 7 | 7 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 3 | | | | 3 | | | |
| Bullous Eruption ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| Eczema ... ... ... | 9 | 2 | 7 | ... | ... | | | | | | | | | | | | | | 1 | | | 1 | 3 | | | | | | | 1 | | | | 1 | 1 | | | | 1 | | |
| Ecthyma ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| Erythema Nodosum ... | 1 | ... | 1 | ... | ... | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Favus ... ... ... | 3 | 3 | ... | ... | ... | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Impetigo ... ... ... | 1 | ... | 1 | ... | ... | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Iodide Eruption ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| Psoriasis ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Varicella Gangrenosa ... | 1 | ... | 1 | ... | ... | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nails— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ingrowing Toe-Nail* ... | 5 | 3 | 2 | ... | ... | | | | | | | | | | | | | 1 | | | | | 2 | | | | | | | | | | | | | | | | 1 | | |
| Lupus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Face* ... ... ... | 15 | 3 | 12 | ... | ... | | | | | 1 | | | | | 2 | | | | | | | | 4 | | | 1 | 4 | | | | | | | 1 | 2 | | | | | | |
| *Upper Extremity* ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Lower Extremity* ... | 2 | 1 | 1 | ... | ... | | | | | 1 | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Vulva* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Sinuses ... ... ... | 3 | 2 | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | 1 | | | | | | | | | | | | | |
| Ulcers— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Chronic and Varicose* ... | 17 | 10 | 6 | ... | 1 | | | | | | | | | | 1 | | | | | | | 2 | | | | 1 | | | | 2 | 3 | | | 3 | 1 | | 1 | 2 | 1 | | |
| *Perforating* ... ... | 9 | 6 | 2 | 1 | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 3 | 1 | 1 | | 1 | 1 | | | 1 | | | |
| *Simple* ... .. ... | 10 | 6 | 3 | 1 | ... | 1 | 1 | | | | | | | 1 | 1 | | | | | | | | | | | 1 | | | | 3 | | 1 | | | 1 | | | | | | |

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| INJURY. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE CUTANEOUS SYSTEM (*cont.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcers (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Strumous* ... ... ... | 3 | 2 | 1 | ... | ... | | | | | | | | | 1 | 1 | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| *Syphilitic* ... ... ... | 3 | 2 | 1 | ... | ... | | | | | | | | | 1 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| Scars— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Contracted* ... ... | 4 | 3 | 1 | ... | ... | 2 | | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | | | | |
| INJURIES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Burns ... ... ... | 35 | 16 | 9 | 7 | 3 | 4 | 6 | 5 | ... | 2 | ... | ... | 1 | 1 | ... | ... | ... | 4 | ... | 1 | ... | 4 | 1 | ... | ... | ... | 1 | ... | ... | 1 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... |
| Scalds ... ... ... | 20 | 3 | 12 | 2 | 3 | 1 | 7 | 1 | 2 | 1 | 2 | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... |
| INJURIES OF THE HEAD AND FACE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions ... ... ... | 9 | 6 | 3 | ... | ... | 2 | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Wounds ... ... ... | 39 | 31 | 6 | 2 | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 3 | ... | ... | ... | 5 | ... | 1 | ... | 5 | 2 | ... | ... | 6 | 1 | 1 | ... | 1 | 3 | ... | ... | 6 | ... | ... | ... |
| Concussion of Brain ... | 47 | 37 | 10 | ... | ... | 2 | 1 | ... | ... | 3 | 3 | ... | ... | 4 | 1 | ... | ... | 8 | 1 | ... | ... | 7 | 2 | ... | ... | 3 | 2 | ... | ... | 2 | ... | ... | ... | 6 | ... | ... | ... | 2 | ... | ... | ... |
| Laceration of Brain ... | 2 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Injuries to the Eye— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Burns ... ... ... | 7 | 6 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Contusions ... ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Dislocation of Lens ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Foreign Body in Eye ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Rupture of Globe ... | 7 | 3 | 4 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | 1 | ... | ... |
| Wounds ... ... ... | 22 | 17 | 5 | ... | ... | 1 | 2 | ... | ... | 4 | 1 | ... | ... | 5 | 1 | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |

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| INJURY. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **INJURIES OF THE HEAD AND FACE (*cont.*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fractures— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Simple)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Skull (Vertex)* ... | 9 | 3 | 3 | 2 | 1 | ... | 2 | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Skull (Base)* ... ... | 10 | 4 | ... | 6 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | 1 | ... | 1 | 2 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... |
| *Jaw Bones* ... ... | 9 | 7 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 3 | ... | ... | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Malar Bone* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Nasal Bones* ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (Compound)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Skull (with Depression)* | 4 | 3 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Old, with Bad Union— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Skull* ... ... ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **INJURIES OF THE ABDOMEN.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions ... ... ... | 9 | 9 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Wounds ... ... ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Liver, Ruptured ... ... | 3 | 1 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **INJURIES OF THE THORAX.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions ... ... ... | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Wounds ... ... ... | 3 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Lung, Ruptured ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Fractures (*Ribs*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (*With Injury to Lung*)... | 8 | 5 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | 2 | 1 | ... | ... | 1 | ... | ... | 1 | ... | ... | ... |
| (*Without Injury to Lung*) | 20 | 13 | 2 | 4 | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | 3 | ... | ... | ... | 2 | ... | 1 | ... | 2 | ... | 1 | ... | 2 | 2 | 1 |

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| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **INJURIES OF THE NECK.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wounds ... ... ... | 6 | 5 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Fracture—Dislocation of Spine ... ... ... | 4 | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| **INJURIES OF THE BACK.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concussion of Spinal Cord... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Contusions ... ... ... | 13 | 9 | 4 | ... | ... | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | 1 | ... | ... |
| Fracture — Dislocation of Spine ... ... ... | 2 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| **INJURIES OF THE PELVIS AND GENITALS.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions ... ... ... | 4 | 4 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Wounds— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Labium* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| *Vagina* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Perineum* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Scrotum* ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Fractures— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Pelvic Bones* ... ... | 7 | 4 | 1 | 2 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | 1 | ... | ... |
| **INJURIES OF THE UPPER EXTREMITY.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions ... ... ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Wounds ... ... ... | 41 | 33 | 7 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... | 6 | 2 | ... | ... | 10 | ... | ... | ... | 8 | 3 | 1 | ... | 1 | 1 | ... | ... | 2 | ... | ... | ... | 1 | ... | ... |

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| INJURY. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| INJURIES OF THE UPPER EXTREMITY (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wounds and Injuries of Nerves— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Recent Wounds)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Median* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ulnar* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| (Old Wounds)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Median* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Median and Ulnar* ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ulnar* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Fractures— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Simple)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Clavicle* ... ... | 4 | 3 | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | 2 | | | |
| *Scapula* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| *Humerus* ... ... | 6 | 3 | 3 | ... | ... | | | | | | | | | 1 | | | | | | | | 1 | | | | 1 | 1 | | | | | | | 1 | | | 1 | | |
| *Radius and Ulna* ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | |
| *Radius* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| *Phalanges* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| (Compound)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Humerus* ... ... | 5 | 5 | ... | ... | ... | | | | | | | | | | | | | 2 | | | | 2 | | | | | | | | 1 | | | | | | | | | |
| *Radius and Ulna* ... | 6 | 5 | ... | 1 | ... | | | | | | | | | 1 | | | | 1 | | | | | | | | 1 | | | | 1 | | 1 | | 1 | | | | | |
| (Ununited)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Humerus* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| Separation of Epiphysis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Humerus* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Radius* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |

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| INJURY. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| INJURIES OF THE UPPER EXTREMITY (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dislocations— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Simple)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Elbow* ... ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | |
| *Shoulder* ... ... | 2 | ... | 2 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | |
| (Compound)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Finger* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| *Thumb* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| (Old)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Shoulder* ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | |
| INJURIES OF THE LOWER EXTREMITY. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions ... ... ... | 15 | 10 | 5 | ... | ... | 1 | | | | 1 | | | | | | | | 1 | | | | 1 | 2 | | | 3 | | | | 1 | 1 | | | 1 | | | | 1 | 2 | | |
| Wounds ... ... ... | 22 | 19 | 2 | ... | 1 | | | | 1 | 1 | | | | 6 | | | | 3 | | | | 3 | | | | 1 | 1 | | | 3 | 1 | | | 1 | | | | 1 | | | |
| Fractures— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Simple)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur*— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Extrascapular*) ... | 3 | 2 | 1 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | 1 | 1 | | |
| (*Intracapsular*) ... | 14 | 7 | 7 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | 4 | 7 | | |
| (*Shaft*) ... ... | 62 | 53 | 8 | 1 | ... | 7 | 3 | | | 12 | 1 | | | 2 | 1 | | | 7 | 1 | | | 2 | | | | 6 | | | | 4 | | | | 11 | | | 1 | 2 | 2 | | |
| *Patella* ... ... ... | 41 | 30 | 10 | ... | 1 | | | | | | | | | | | | | 1 | | | | 3 | 1 | | | 13 | 4 | | | 7 | 3 | | | 5 | 2 | | | 1 | | | 3 |
| *Tibia and Fibula* ... | 63 | 54 | 8 | 1 | ... | 1 | | | | 6 | | | | 9 | | | | 4 | | | | 7 | 2 | 1 | | 13 | 2 | | | 7 | 1 | | | 2 | 1 | | | 5 | 2 | | |
| *Tibia* ... ... ... | 33 | 25 | 8 | ... | ... | | 2 | | | 5 | 1 | | | 6 | | | | 2 | | | | 3 | | | | 2 | 1 | | | 4 | | | | 3 | | | | | 4 | | |
| *Fibula* ... ... ... | 23 | 17 | 6 | ... | ... | | | | | | | | | 1 | | | | 1 | 1 | | | 3 | | | | 6 | 1 | | | 4 | 2 | | | 1 | 2 | | | 1 | | | |
| *Potts'* ... ... ... | 35 | 22 | 13 | ... | ... | | | | | | | | | | | | | 1 | | | | 1 | 2 | | | 10 | 1 | | | 6 | 4 | | | 3 | 5 | | | 1 | 1 | | |

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| INJURY. | Total. | Discharged. | | Died. | | Under 5. | | | | — 10. | | | | — 15. | | | | — 20. | | | | — 30. | | | | — 40. | | | | — 50. | | | | — 60. | | | | Over 60. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **INJURIES OF THE LOWER EXTREMITY (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fractures (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Simple) (*cont.*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Astragalus* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| *Os Calcis* ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| *Metatarsus* ... ... | 2 | 2 | ... | ... | ... | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| (Compound)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... ... | 3 | 2 | ... | 1 | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 1 | | | 1 | | | |
| *Tibia and Fibula* ... | 10 | 10 | ... | ... | ... | | | | | | | | | | | | | 2 | | | | 4 | | | | 1 | | | | 2 | | | 1 | | | | | | |
| *Tibia* ... ... ... | 6 | 4 | 1 | 1 | ... | | | | | | 1 | | | | | | | | | | | 2 | | | | 1 | | | | | | | | 1 | | 1 | | | |
| *Tarsus* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Toe* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| (Old, with Bad Union)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... ... | 3 | 1 | 2 | ... | ... | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| *Patella* ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | |
| *Tibia* ... ... ... | 1 | 1 | ... | ... | ... | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *Fibula* ... ... ... | 1 | ... | 1 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| *Potts'* ... ... ... | 8 | 4 | 4 | ... | ... | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | 2 | 4 | | | | | | | | |
| (Ununited)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Femur* ... ... ... | 5 | 5 | ... | ... | ... | | | | | | | | | 2 | | | | | | | | 1 | | | | 2 | | | | | | | | | | | | | |
| *Tibia* ... ... ... | 3 | 3 | ... | ... | ... | | | | | 1 | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| Dislocations— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Simple)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Knee* ... ... ... | 3 | 3 | ... | ... | ... | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | 1 | | | | | | |
| **DISEASES AND INJURIES** Unclassified, Admissions for Instruments, &c. ... | 180 | 115 | 65 | ... | ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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# ABSTRACT OF TABLE I.,

*With Average Duration of Surgical Patients in the Hospital.*

| | | |
|---|---|---|
| Discharged, Cured or Relieved ... ... ... ... ... ... | M. — | 2,120 |
| | F. — | 1,224 |
| Died ... ... ... ... ... ... ... ... ... ... | M. — | 114 |
| | F. — | 54 |
| *Remaining in, December 31st, 1891— | | |
| Women and Children... ... ... ... ... ... ... ... | | 125 |
| Men ... ... ... ... ... ... ... ... ... ... | | 215 |
| Average stay of Men ... ... ... ... ... ... ... | | 22 days. |
| „ Women ... ... ... ... ... ... ... | | 25 „ |

* These cases are not included in Table I.

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# APPENDIX TO TABLE I.

---

**ANTHRAX.**

In each case the malignant pustule was in the forearm. The patients were men, aged 41 and 51 years respectively, and made rapid recoveries after excision of the disease. In the last case the bacillus was proved fatal to animals, and was isolated.

**TUMOURS.**

In the case of a woman, aged 64 years, there was a primary epithelioma in the glands of the groin. No other growth was found at the post-mortem examination.

A man of 65 died of medullary carcinoma of the prostate, with secondary growths in the lumbar glands.

A woman, aged 48, died from carcinoma of the thyroid, with secondary extension to the spine and œsophagus.

In the four cases of duct carcinoma of the breast, the lymphatic glands were not involved.

A man, aged 30, died of lympho-sarcoma, involving the skin of the right side of the chest and neck, the ribs, the mediastinum, and lung.

A girl, aged 17, was under treatment for an extensive lymphangioma of the arm and chest. This had developed in the site of a congenital hygroma.

**MALFORMATIONS AND DEFORMITIES.**

In one case of imperforate anus, there was a recto-vaginal fistula.

**DISEASES OF THE EAR.**

A child, aged 7, who was admitted with otitis, died seven days later with a cerebral abscess; and another child, aged 10, admitted for a similar affection, died a month later from chronic meningitis.

**DISEASES OF THE DIGESTIVE SYSTEM.**

Of five cases of intussusception, three recovered without operation, and two died after abdominal section.

*Intestinal Obstruction.*

In one case, that of a man aged 67, the symptoms yielded to simple treatment, and no diagnosis was made. In the case of a woman, aged 45, with symptoms of mechanical obstruction, an abdominal section showed only general septic peritonitis.

The case of volvulus was that of a man, aged 65, who was admitted in a dying condition, with intestinal obstruction following six weeks after the operation of inguinal colotomy. A post-mortem examination showed that a volvulus had occurred at point where the sigmoid flexure had been fixed in the abdominal wall.

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**DISEASES OF THE GENITO-URINARY ORGANS.**

Of the six patients who died, three were admitted suffering from extravasation of urine, one had uræmia, and two had suppurative nephritis.

**DISEASES OF BONES.**

Of three patients who died of caries of the spine, two men died of exhaustion, due to profuse suppuration from iliac and psoas abscesses. One woman, aged 28, died of amyloid disease.

A youth, aged 20, died of amyloid disease four years after an osteotomy for genu valgum, which had been followed by suppuration and necrosis.

**DISEASES OF JOINTS.**

A girl, aged 17, died of general tuberculosis, following disease of ankle and knee. A child of 9 years of age died from profuse suppuration, due to hip disease, and a boy, aged 11, died of tubercular meningitis. The other death from hip disease occurred in a girl, aged 8, after excision.

**ULCERS.**

A woman, aged 55, with a chronic ulcer of the leg, died of uræmia. A man, aged 43, with perforating ulcer of the foot complicating tabes dorsalis, died of spreading gangrene of the foot. A man, aged 48, with a simple ulcer of the heel, died from pneumonia from which he was suffering when admitted.

**INJURIES OF THE THORAX.**

Of the patients who died of fractures of ribs, one had a ruptured spleen, two had fractures of the femur and pelvis respectively, and one had many ribs broken on each side.

**INJURIES OF THE LOWER EXTREMITY.**

A child, aged 3, died of extensive sloughing, following upon a laceration of the buttock. A man, aged 54, died of pneumonia after simple fracture of the femur. A woman, aged 74, died of apoplexy after fracture of the patella. A man, aged 28, died of delirium tremens after a simple fracture of the tibia.

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## TABLE II.

# SURGICAL OPERATIONS PERFORMED.

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| OPERATIONS ON THE EYE. | | | | | | | | | | | | | | | | | | | | | | | | |
| Tenotomy for Squint... ... | 12 | 16 | 12 | 16 | ... | ... | 2 | 3 | 8 | 9 | 2 | 3 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Cataract— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Extraction* ... ... ... | 17 | 17 | 17 | 17 | ... | ... | ... | ... | 1 | ... | 2 | ... | 1 | ... | 3 | 1 | ... | 3 | 1 | 8 | 6 | 3 | 3 | 2 |
| *Needle Operation* ... ... | 9 | 5 | 9 | 5 | ... | ... | 3 | ... | 2 | 2 | 3 | 1 | ... | 1 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Needle Operation on Opaque Capsule ... ... ... | 7 | 7 | 7 | 7 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | 1 | 1 | ... | ... | 4 | 3 | 2 | 1 | ... |
| Abscision ... ... ... | 5 | 4 | 5 | 4 | ... | ... | 2 | 2 | ... | ... | 2 | 1 | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Extirpation of Globe... ... | 7 | 5 | 7 | 5 | ... | ... | ... | ... | ... | ... | 2 | 1 | 1 | 1 | ... | ... | ... | ... | 2 | 3 | 1 | ... | 1 | ... |
| Removal of Tarsal Tumours... | 4 | 4 | 4 | 4 | ... | ... | ... | ... | 1 | ... | 1 | 3 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Iridectomy ... ... ... | 9 | 10 | 9 | 10 | ... | ... | 2 | 1 | 1 | ... | 1 | ... | ... | ... | 1 | 1 | 2 | 4 | ... | 3 | 1 | 1 | 1 | ... |
| Transplantation of Rabbit's Conjunctiva ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| PLASTIC OPERATIONS. | | | | | | | | | | | | | | | | | | | | | | | | |
| For Cleft Palate ... ... | 7 | 4 | 7 | 4 | ... | ... | ... | ... | 2 | ... | 5 | 3 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Congenital Abnormality of Penis and Scrotum... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |



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## TABLE II. (*continued*).

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **PLASTIC OPERATIONS (*continued*).** | | | | | | | | | | | | | | | | | | | | | | |
| For Fæcal Fistula ... ... | ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Hare-Lip ... ... ... | 9 | 2 | 9 | 2 | ... | ... | 8 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Hypospadias ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Pharyngeal Fistula ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Webbed Fingers ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Imperforate Anus ... | 2 | 3 | ... | 3 | 2 | ... | 2 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Recto-Vesical Fistula ... | 2 | 2 | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| „ Contracted Scars ... | 2 | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **EXCISIONS OF BONES AND JOINTS.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Ankle ... ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Astragalus (*for Talipes*) ... | 1 | 3 | 1 | 3 | ... | ... | ... | 1 | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hip ... ... ... ... | 1 | 2 | 1 | 1 | ... | 1 | 1 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Inferior Maxilla ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Knee ... ... ... ... | 7 | 3 | 6 | 3 | 1 | ... | ... | ... | ... | ... | 4 | 1 | 3 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Superior Maxilla ... ... | 2 | 2 | 1 | 2 | 1 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... |
| Tarsus ... ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Wrist ... ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| OPERATIONS ON BONES. | | | | | | | | | | | | | | | | | | | | | | | | |
| Osteoclasia— | | | | | | | | | | | | | | | | | | | | | | | | |
| Femur— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*For Genu Valgum*) ... | 8 | 3 | 8 | 3 | ... | ... | 3 | 2 | 4 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (*For Ankylosed Knee*) ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tibia and Fibula— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*For Bow Leg*) ... ... | 6 | 2 | 6 | 2 | ... | ... | 5 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tibia— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*For Genu Valgum*) ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Osteotomy— | | | | | | | | | | | | | | | | | | | | | | | | |
| Femur— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*For Genu Valgum*) ... | 3 | 1 | 3 | 1 | ... | ... | ... | 1 | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (*For Ankylosed Hip*) ... | 2 | ... | 2 | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tibiæ— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*For Rickets*) ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Linear Osteotomy ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Resection of Ribs ... ... | 9 | 2 | 8 | 2 | 1 | ... | ... | ... | 1 | 2 | 3 | ... | 3 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Elevation of Depressed Fracture ... ... ... ... | 3 | 1 | 1 | 1 | 2 | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... |
| Femur Trephined for Abscess | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Mastoid Trephined for Suppurative Otitis ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Skull Trephined for Traumatic Epilepsy and Dementia ... | 2 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Skull Trephined for Injury ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Tibia Trephined for Abscess... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |

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## TABLE II. (*continued*).

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| OPERATIONS ON BONES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | |
| Tibia Trephined for Chronic Osteitis ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ununited Fracture of Femur pegged ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Sequestrotomy ... ... | 17 | 7 | 17 | 6 | ... | 1 | ... | 1 | 1 | 1 | 5 | 1 | 5 | 1 | 1 | ... | 3 | ... | 1 | 2 | 1 | 1 | ... | ... |
| Gouging of Bones for Disease | 4 | ... | 4 | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| OPERATIONS ON JOINTS. | | | | | | | | | | | | | | | | | | | | | | | | |
| Removal of Loose Bodies— *Knee* ... ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Knee injected with Iodine for Synovitis ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Operation for Old Dislocation of Shoulder ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| AMPUTATIONS. | | | | | | | | | | | | | | | | | | | | | | | | |
| Primary— Arm ... ... ... ... | 6 | ... | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Fingers— *For Wounds* ... ... | 3 | 2 | 3 | 2 | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... |

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| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| AMPUTATIONS (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Upper Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Compound Fracture* | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Knee Joint— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Compound Fracture* | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Leg— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Upper Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Compound Fracture* | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Foot ... ... ... ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Toes— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Wounds* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Secondary— | | | | | | | | | | | | | | | | | | | | | | | | |
| Arm— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Middle Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Lacerated Wound* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Disease— | | | | | | | | | | | | | | | | | | | | | | | | |
| Ankle— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Disease of Tarsus* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ankle (Syme)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Disease of Tarsus* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Infantile Paralysis*... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Arm— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Disease of Elbow* ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| „ *Disease of Wrist* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| „ *Ununited Fracture*... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Fingers ... ... ... | 4 | 3 | 4 | 3 | ... | ... | 1 | ... | ... | ... | ... | 3 | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... |

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| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **AMPUTATIONS (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | |
| For Disease (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| Knee Joint— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Sarcoma* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Infantile Paralysis* .. | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Leg— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Upper Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Necrosis of Tibia* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Sarcoma* ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| *For Chronic Ulcer* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *For Gangrene* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| (*Lower Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Acute Osteitis of Tibia* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Penis— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Epithelioma* ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... |
| Stump— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Leg*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Conical* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (*Thigh*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Ulcer* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Thigh— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Upper Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Acute Periostitis of Femur* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Epithelioma*... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Sarcoma of Femur*... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| OPERATIONS. | TOTAL. | | Discharged. | | Died. | | AGE AND SEX. Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| AMPUTATIONS (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | |
| For Disease (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| (*Middle Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Enchondroma of Femur* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Acute Periostitis* ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (*Lower Third*)— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Disease of Knee* ... | 7 | 1 | 6 | 1 | 1 | ... | ... | ... | ... | ... | 3 | 1 | 1 | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | ... |
| Toes ... ... ... ... | 3 | 1 | 3 | 1 | ... | ... | 1 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| OPERATIONS ON BREAST. | | | | | | | | | | | | | | | | | | | | | | | | |
| Amputation of Breast for Carcinoma ... ... ... | ... | 20 | ... | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 6 | ... | 8 | ... | 5 | ... | ... |
| Amputation of Breast for Duct Cancer ... ... | ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... |
| Amputation of Breast for Sarcoma... ... ... ... | 1 | 7 | 1 | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 5 | ... | 2 | ... | ... | ... | ... |
| Amputation of Breast for Cystic Disease ... ... | ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... | ... | ... | ... |
| Amputation of Breast with removal of Axillary Glands | 1 | 21 | 1 | 20 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 7 | ... | 6 | ... | 5 | 1 | ... |
| Local Removal of Carcinoma, Primary and Recurrent ... | ... | 16 | ... | 16 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | 7 | ... | 6 | ... | 1 | ... | ... |
| Removal of Adeno-Fibroma... | 2 | 16 | 2 | 16 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 | ... | 5 | 1 | 1 | 1 | ... | ... | ... | ... | ... |
| Removal of Cysts ... ... | ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... |

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| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
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| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| REMOVAL OF TUMOURS. | | | | | | | | | | | | | | | | | | | | | | | | |
| Adenoma ... ... ... | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Bronchocele ... ... ... | ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... |
| Dermoid Cyst ... ... ... | 8 | 4 | 8 | 4 | ... | ... | ... | ... | ... | ... | 1 | 1 | 6 | 1 | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... |
| Periosteal Cyst ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Sebaceous Cysts ... ... | 4 | 1 | 4 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Serous Cysts ... ... ... | 3 | 4 | 3 | 4 | ... | ... | 1 | ... | 1 | 1 | ... | 1 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Enchondroma ... ... ... | 3 | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Exostosis ... ... ... | 7 | 4 | 7 | 4 | ... | ... | ... | ... | ... | ... | 6 | 2 | ... | 2 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Fibroma ... ... ... | 6 | 6 | 6 | 6 | ... | ... | ... | ... | ... | ... | 3 | 1 | 1 | 5 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... |
| Granuloma ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Lipoma... ... ... ... | 8 | 10 | 8 | 10 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 4 | 1 | 1 | 5 | 4 | ... | 1 | 1 | ... | ... | ... |
| Lymphoma ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Nævus ... ... ... ... | 2 | 1 | 2 | 1 | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Neuroma ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Osteoma ... ... ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Papilloma ... ... ... | 2 | 1 | 2 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Parotid Tumour ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Polypus ... ... ... | 2 | 7 | ... | 7 | ... | ... | ... | 1 | ... | 1 | ... | 3 | ... | 1 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Epithelioma— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arm* ... ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Buttock* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| *Cheek* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... |
| *Ear* ... ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *Floor of Mouth* ... ... | 3 | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | ... | ... | ... |
| *Forehead* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| *Lip* ... ... ... ... | 12 | ... | 12 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 4 | ... | 3 | ... | 4 | ... |
| *Nose* ... ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |

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| | TOTAL. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **REMOVAL OF TUMOURS (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | |
| Rodent Ulcer ... ... ... | 5 | 4 | 5 | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 2 | 2 | 1 | 1 | 1 | ... |
| Sarcoma— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Arm* ... ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Back* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| *Face* ... ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| *Groin* ... ... ... | 3 | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| *Hand* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Muscle* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Nose* ... ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| *Parotid* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... |
| *Superior Maxilla* ... ... | ... | 3 | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 2 | ... | ... | ... | ... |
| **OPERATIONS ON TONGUE.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Excision of Whole Tongue with Scissors ... ... | 6 | 1 | 3 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 2 | ... | 2 | ... | 1 | ... |
| Excision of one Lateral Half with Scissors ... ... | 1 | 1 | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... |
| Excision of Anterior Half with Ecraseur ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Local Removal of Epithelioma... ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| Removal of Lymphangioma... | 1 | 1 | 1 | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **OPERATIONS ON BURSÆ, FASCIÆ, AND TENDONS.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Bursæ Removed ... ... | 4 | 8 | 4 | 8 | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | 2 | 1 | 2 | 1 | ... | ... | 1 | 1 | ... | ... | ... |
| Suture of Tendons ... ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Tenotomy— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Contracted Stump* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Contracted Palmar Fascia* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Old Potts' Fracture* ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *For Talipes* ... ... ... | 4 | 3 | 4 | 3 | ... | ... | ... | 2 | 1 | ... | 2 | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| *For Wry Neck* ... ... | 1 | 2 | 1 | 2 | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Hammer Toe* ... ... | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **OPERATIONS ON NOSE.** | | | | | | | | | | | | | | | | | | | | | | | | |
| For Deviated Septum ... | 4 | 1 | 4 | 1 | ... | ... | ... | ... | 2 | ... | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Nasal Spur ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **OPERATIONS ON NERVES.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Suture of Nerves— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Median* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Median and Ulnar* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Ulnar* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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| | TOTAL. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **OPERATIONS ON THE VASCULAR SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Ligature for Aneurysm— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Popliteal* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Ligature for Traumatic Aneurysm— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Posterior Tibial* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Femoral (for Aneurysm in Hunter's Canal)*... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Needling Operation for Aneurysm— | | | | | | | | | | | | | | | | | | | | | | | | |
| *Carotid* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| *Popliteal* ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Injection of Ferric Chloride into Axillary Aneurysm ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ligature or Excision of Varicose Veins ... ... ... | 12 | 3 | 12 | 3 | ... | ... | ... | ... | ... | ... | 4 | ... | 5 | 2 | 2 | ... | 1 | ... | ... | 1 | ... | ... | ... | ... |
| **OPERATIONS ON GENITO-URINARY ORGANS.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Circumcision ... ... ... | 18 | ... | 18 | ... | ... | ... | 4 | ... | 2 | ... | 5 | ... | 5 | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... |
| Nephrotomy— | | | | | | | | | | | | | | | | | | | | | | | | |
| *(For Renal Colic)*... ... | ... | 2 | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Nephro-Lithotomy ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Nephrectomy ... ... ... | 2 | 3 | 2 | 1 | ... | 2 | ... | ... | ... | ... | ... | ... | 1 | 1 | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... |
| Lithotrity ... ... ... | 5 | ... | 5 | ... | ... | ... | 1 | ... | 1 | ... | 1 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Suprapubic Lithotomy ... | 2 | 1 | ... | 1 | 2 | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |

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## TABLE II. (*continued*).

| OPERATIONS | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
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| | TOTAL. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| OPERATIONS ON GENITO-URINARY ORGANS (*cont.*). | | | | | | | | | | | | | | | | | | | | | | |
| Median Cystotomy— | | | | | | | | | | | | | | | | | | | | | | |
| *For Enlarged Prostate* ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| Suprapubic Cystotomy— | | | | | | | | | | | | | | | | | | | | | | |
| *For Carcinoma of Bladder* | 3 | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 1 | ... |
| Castration— | | | | | | | | | | | | | | | | | | | | | | |
| *For Sarcoma* ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| *For Sarcoma of Retained Testis* ... ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Retained Testis* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Syphilitic Disease* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Tubercular Disease* ... | 3 | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Hæmatocele* ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ligature of Varicocele ... | 10 | ... | 10 | ... | ... | ... | ... | ... | ... | ... | 4 | ... | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Radical Cure of Hydrocele ... | 7 | ... | 7 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 2 | ... | 1 | ... | 2 | ... | 1 | ... | ... | ... | ... | ... |
| External Urethrotomy ... | 13 | ... | 13 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | 2 | ... | 5 | ... | ... | ... | 2 | ... |
| Internal Urethrotomy ... | 7 | ... | 7 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | 2 | ... | 3 | ... | ... | ... | ... | ... | ... | ... |
| Galvano-Cautery for Enlarged Prostate ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| OPERATIONS ON THE RECTUM AND ANUS. | | | | | | | | | | | | | | | | | | | | | | | | |
| Anal Fissure Incised ... ... | 1 | 5 | 1 | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 4 | 1 | ... | ... | ... | ... | ... | ... | ... |
| Anal Fistula Incised ... ... | 19 | 6 | 19 | 6 | ... | ... | ... | ... | ... | ... | 1 | ... | 3 | 1 | 5 | 3 | 8 | 2 | 2 | ... | ... | ... | ... | ... |
| Rectal Prolapse Ligatured ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| Hæmorrhoids Ligatured ... | 19 | 8 | 19 | 8 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 2 | 7 | 4 | 6 | 2 | 2 | ... | ... | ... | ... | ... |

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| | TOTAL. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **OPERATIONS ON THE RECTUM AND ANUS (*continued*).** | | | | | | | | | | | | | | | | | | | | | | |
| Hæmorrhoids Crushed ... | 4 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... |
| Proctotomy— | | | | | | | | | | | | | | | | | | | | | | |
| (*For Fibrous Stricture*) ... | 1 | 3 | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... |
| Excision of Rectum ... ... | 1 | 2 | 1 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 |
| **MISCELLANEOUS OPERATIONS.** | | | | | | | | | | | | | | | | | | | | | | |
| Electrolysis for Nævus ... | 6 | 4 | 6 | 4 | ... | ... | 2 | 4 | ... | ... | ... | ... | 3 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Nævus Cauterised ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Removal of Malignant Pustule | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... |
| Removal of Strumous Glands. | 4 | 4 | 4 | 4 | ... | ... | ... | ... | 1 | ... | 1 | 2 | 1 | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| Erasion or Excision of Lupus. | 2 | 8 | 2 | 8 | ... | ... | ... | ... | 1 | ... | ... | 2 | ... | 2 | ... | 3 | ... | ... | 1 | 1 | ... | ... | ... | ... |
| Erasion of Carbuncle... ... | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Ingrowing Toe-nail Removed. | 3 | 2 | 3 | 2 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 2 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| Removal of Adenoid Vegetations ... ... ... ... | 10 | 7 | 10 | 7 | ... | ... | 1 | ... | 6 | 1 | 3 | 4 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Removal of Enlarged Tonsils.. | ... | 4 | ... | 4 | ... | ... | ... | ... | ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Spina Bifida injected with Morton's Fluid ... ... | 2 | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Koch's Fluid injected— | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Disease of Ankle* ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Tubercular Ulcer of Leg* | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *For Lupus* ... ... ... | ... | 3 | ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |

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## TABLE II. (*continued*).

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL. | | Discharged. | | Died. | | Under 5 Years. | | = 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| OPERATIONS FOR HERNIÆ. | | | | | | | | | | | | | | | | | | | | | | |
| Herniotomy for Strangulated Hernia— | | | | | | | | | | | | | | | | | | | | | | |
| *Femoral* ... ... ... | 3 | 22 | 1 | 13 | **2** | **9** | ... | ... | ... | 1 | ... | ... | ... | 1 | 1 | 2 | 1 | 5 | ... | 4 | 1 | 5 | ... | 4 |
| *Inguinal* ... ... ... | 6 | ... | 6 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 2 | ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | ... | ... |
| *Umbilical* ... ... ... | 1 | 1 | .. | ... | **1** | **1** | ... | ... | .. | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| Radical Cure— | | | | | | | | | | | | | | | | | | | | | | |
| (*Reducible Hernia*)— | | | | | | | | | | | | | | | | | | | | | | |
| *Inguinal* ... ... ... | 8 | ... | 8 | ... | ... | ... | ... | ... | 1 | ... | 2 | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Femoral* ... ... ... | ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| (*Irreducible Hernia*)— | | | | | | | | | | | | | | | | | | | | | | |
| *Femoral* ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| *Inguinal* ... ... ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Umbilical* ... ... ... | 1 | ... | ... | ... | **1** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| *Ventral* .. ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Hydrocele of Hernial Sac Removed ... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 |
| COLOTOMY. | | | | | | | | | | | | | | | | | | | | | | |
| Inguinal— | | | | | | | | | | | | | | | | | | | | | | |
| *For Carcinoma* ... ... | 10 | 8 | 10 | 5 | ... | **3** | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | 2 | ... | 2 | 3 | 5 | 3 | ... | ... |
| *For Fibrous Stricture* ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| *For Recto-Vaginal Fistula* | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| ABDOMINAL SECTION. | | | | | | | | | | | | | | | | | | | | | | |
| For Contusion of Abdomen ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Hydatid of Liver ... | 2 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Intussusception ... ... | 1 | 2 | ... | ... | **1** | **2** | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |

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| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total. | | Discharged. | | Died. | | Under 5 Years. | | — 10. | | — 20. | | — 30. | | — 40. | | — 50. | | — 60. | | — 70. | | Over 70. | |
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **ABDOMINAL SECTION (*cont.*).** | | | | | | | | | | | | | | | | | | | | | | | | |
| For Malignant Disease of Mesentery ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| For Acute Peritonitis ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Tubercular Peritonitis ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Typhlitis ... ... ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Fibrous Stricture with Obstruction ... ... ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| Gastrostomy ... ... ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... |
| Enterostomy— *For Peritonitis and Obstruction* ... ... ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... |
| Intestinal Anastomosis— *For Carcinoma* ... ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... |
| **TRACHEOTOMY.** | | | | | | | | | | | | | | | | | | | | | | | | |
| For Diphtheria and Croup ... | 14 | 17 | 5 | 4 | 9 | 13 | 10 | 12 | 3 | 4 | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Foreign Body in Trachea. | ... | 2 | ... | 2 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Fibroma of Larynx ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... |
| For Laryngitis ... ... | 8 | 5 | 4 | 4 | 4 | 1 | 4 | 3 | 1 | 1 | ... | ... | ... | ... | 2 | 1 | 1 | ... | ... | ... | ... | ... | ... | ... |
| For Œdema of Glottis ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| For Papilloma of Larynx ... | 1 | 1 | 1 | 1 | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **OVARIOTOMY.** | | | | | | | | | | | | | | | | | | | | | | | | |
| For Ovarian Cyst ... ... | ... | 21 | ... | 13 | ... | 8 | ... | ... | ... | ... | ... | ... | ... | 5 | ... | 6 | ... | 7 | ... | 2 | ... | 1 | ... | ... |
| Hysterectomy... ... ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

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# STATISTICS OF ANÆSTHETICS.

During the year Anæsthetics were administered 4,033 times.

| | | |
|---|---|---|
| Chloroform ... ... ... ... .. ... | 2,031 | times. |
| Nitrous Oxide Gas ... ... ... ... . | 1,006 | „ |
| Ether ... ... ... ... ... ... ... | 866 | „ |
| Gas and Ether ... ... ... ... ... | 130 | „ |
| Total ... ... ... ... ... | 4,033 | „ |

There was one death from Chloroform. The patient was a woman, aged 67, who was admitted with a strangulated hernia. This was successfully operated upon, and the wound healed. She then complained of a fissure of the anus, and was put again under the influence of chloroform for the purpose of operating. Directly after the fissure was incised the heart suddenly ceased to beat, and death ensued. A post-mortem examination showed no heart disease. The lungs were emphysematous.

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# APPENDIX TO TABLE II.

**PLASTIC OPERATIONS.**

*Imperforate Anus.*

Two infants died after their condition had been relieved by a perineal operation. In one the cause of death was inanition, in the other case no examination was allowed.

**EXCISIONS.**

A girl, aged 8 years, died of collapse six hours after excision of the hip. It was afterwards ascertained that she had chronic peritonitis at the time of operation.

A youth, aged 17 years, died after excision of the knee. The operation eventuated in amputation of the thigh in its lower third, from which the patient did not recover.

A man, aged 52 years, died of collapse a few hours after excision of the superior maxilla. Bleeding was free at the operation, and the body was decidedly anæmic.

**OPERATIONS ON BONES.**

A labouring man died after excision of ribs, which was performed for empyema of the right side. It was afterwards ascertained that there was recent pleuritis of the left side together with pericarditis.

A youth of 14 years died of intracranial hæmorrhage after a depressed fracture of the vertex of the skull had been elevated.

A man, aged 25, died after a similar operation from extensive laceration of the brain.

A child, aged 10, died of meningitis after the mastoid cells had been trephined.

A woman, aged 50, died of septicæmia after an extensive operation for the removal of necrosed bone from the lower third of the femur.

**AMPUTATIONS FOR INJURY.**

An engine-driver, aged 50, died after amputation of the upper third of the right thigh and left foot. Transfusion of saline solution was done with temporary relief.

Only one case, a man, aged 40, died after secondary amputation of the lower third of the thigh for suppurating arthritis.

**OPERATIONS ON THE BREAST.**

A woman, aged 49, died a fortnight after amputation of the breast, with pyæmic abscesses in various organs.

**REMOVAL OF TUMOURS.**

In 142 cases of removal of tumours from various regions there was no death.

**OPERATIONS ON THE TONGUE.**

A man, aged 58, and a woman, aged 63, both died of pneumonia after excision of the whole tongue in the first case, and of half the tongue in the second. In the first case pneumonia was complicated with erysipelas. A man, aged 58, died from bronchitis after the tongue had been excised with scissors. A man, aged 71, died with abscess of the lung after excision of the whole tongue.

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**OPERATIONS UPON ARTERIES.**

A man, aged 39, who had aneurisms of the axillary and innominate arteries, died after the injection of perchloride of iron in the axillary aneurism. This caused thrombosis of a number of vessels upon the proximal side of the aneurism, including the vertebral, middle cerebral, anterior communicating and facial.

**OPERATIONS UPON THE GENITO-URINARY ORGANS.**

A woman, aged 28, died of peritonitis, caused by an old perforation of the vermiform appendix, after exploration of the right kidney, the other organ having been removed at a previous operation. Two cases of nephrectomy died of shock—a child, aged 3 years, died of bronchitis the day after suprapubic lithotomy—and in the case of a man, aged 70, no examination was allowed.

A man, aged 68, died of cystitis and nephritis after median cystotomy for the relief of hypertrophied prostate.

A man, aged 30, died of secondary infection of the peritoneum and lumbar glands after the removal of a retained testis, which had become the seat of malignant disease.

**OPERATIONS UPON THE RECTUM AND ANUS.**

No patient died after operations under this heading.

**OPERATIONS FOR STRANGULATED HERNIA.**

Of the thirteen patients who died after operations for the relief of strangulated herniæ, five died of pneumonia. Two died of carcinoma of which they suffered when the strangulation supervened. In two cases the intestine was gangrenous at the operation. In one an artificial anus was made, but gave no relief. In the other, the gangrenous gut was removed and an intestinal anastomosis performed.

**COLOTOMY.**

Lumbar colotomy was not performed.

Of the twenty cases in which inguinal colotomy was done, three died. One was performed for the relief of obstruction, but was fatal owing to gangrene of intestine. Another woman, aged 57, died of shock the day after the operation. She was exceedingly obese and a very large incision was required. A woman, aged 66, died of cellulitis and gangrene of the abdominal wall after the operation.

**ABDOMINAL SECTION.**

Abdominal section was performed three times for intussusception. In one case the intussusception was associated with polypus of the small intestine. Enterectomy was performed and an artificial anus established. The patient died the next day of peritonitis. In another the abdomen was opened after the injection of air had failed. No examination was allowed. An infant, aged 13 months, died of shock a few hours after an intussusception had been reduced. A small mass the size of a hazel nut was found in the intestinal wall, at the seat of the intussusception.

A girl, aged 10, died of shock whilst the abdomen was being washed out for septic peritonitis. It was afterwards ascertained that she had pleuritis upon both sides.

A youth of 15 recovered after laparotomy for typhlitis. The mass felt before the operation was found to be a swollen and congested cæcum and colon.

A patient upon whom gastrostomy was performed died of exhaustion two days after, and another in whom enterostomy was performed died of inanition. The opening was in the jejunum. Another case, in which enterostomy was done for peritonitis, died unrelieved.

Intestinal anastomosis was done for cancer of the ileum, but the patient died of shock the same evening.

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# SUB-TABLE, SHOWING THE NUMBER OF CASES OF ERYSIPELAS, PYÆMIA, &c., IN THE SURGICAL WARDS.

| DISEASES. | Under 5. | | 5—10. | | 10—20. | | 20—30. | | 30—40. | | 40—50. | | 50—60. | | 60—70. | | 70—80. | | Total. | | Deaths. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **Cutaneous Erysipelas—** | | | | | | | | | | | | | | | | | | | | | | |
| Admissions ... ... ... ... | 2 | 2 | 2 | ... | 1 | 5 | 1 | ... | ... | ... | ... | ... | 1 | 1 | 1 | ... | ... | ... | 10 | 8 | **2** | ... |
| Occurring in Hospital ... ... | ... | 1 | ... | ... | 1 | ... | 1 | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 4 | 2 | ... | ... |
| Occurring after operation ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... |
| **Phlegmonous Erysipelas and Cellulitis—** | | | | | | | | | | | | | | | | | | | | | | |
| Admissions ... ... ... ... | 1 | 2 | 2 | ... | 2 | 2 | 11 | 3 | 14 | 1 | 7 | 1 | 1 | 4 | 10 | 1 | 2 | 1 | 50 | 15 | **2** | ... |
| Occurring in Hospital ... ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | 1 | ... | ... |
| Occurring after operation ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | 1 | ... | **1** |
| **Pyæmia and Septicæmia—** | | | | | | | | | | | | | | | | | | | | | | |
| Admissions ... ... ... ... | ... | 1 | ... | 1 | ... | 1 | 1 | 1 | ... | 1 | ... | ... | 1 | ... | 1 | ... | ... | ... | 3 | 5 | **2** | **1** |
| Occurring in Hospital ... ... | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... |
| Occurring after operation ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | **1** | **1** |
| **Delirium Tremens—** | | | | | | | | | | | | | | | | | | | | | | |
| Admissions ... ... ... ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | **1** | ... |
| Occurring in Hospital ... ... | ... | ... | ... | ... | ... | ... | 3 | ... | 2 | ... | 3 | ... | 2 | ... | 1 | ... | ... | ... | 11 | ... | **3** | ... |

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# APPENDIX TO SUB-TABLE OF CASES OF ERYSIPELAS, &c.

**ERYSIPELAS** (*Cutaneous*).

*Commencing in the Hospital.*

Six cases of cutaneous erysipelas occurred in patients who had been admitted with a burn, an abscess in the axilla, a contused wound of the scalp, acute periostitis of the tibia, two after abscesses in the groin and breast. They all recovered.

There was one case of cutaneous erysipelas after an operation on a sarcoma of the upper jaw.

**ERYSIPELAS** (*Phlegmonous*).

*Commencing in the Hospital.*

A male, aged 42, had phlegmonous erysipelas after admission for a punctured wound of the leg. He made a safe recovery. A female had the same complaint after having been admitted with a fractured tibia. She recovered, but amputation of the forearm had to be done.

There was a case of cellulitis and gangrene of the abdominal wall after inguinal colotomy, which ended fatally; and a woman, aged 56, had the forearm amputated for cellulitis following upon whitlow. She made a safe recovery.

**PYÆMIA AND SEPTICÆMIA.**

*Admissions.*

Three males were admitted with chronic pyæmia, of whom two died. Five females were admitted with chronic pyæmia, and of these only one died.

*Occurring in Hospital.*

A girl, aged 9, had pyæmia after periostitis and epiphysitis of the femur. She recovered after amputation of the thigh. A woman, aged 23, recovered from chronic pyæmia, which followed upon abscess of the breast and erysipelas. A man, aged 26, recovered from chronic pyæmia following upon a bullet-wound of the skull, for which he was trephined.

**DELIRIUM TREMENS.**

A publican was admitted with delirium tremens, of which he died. Eleven others, all men, had delirium tremens after admission with fractures, cut heads, and slight injuries. Of these, three died.

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# TABLE OF AMPUTATIONS WITH THE PERCENTAGE OF DEATHS DURING THE TEN YEARS

*from* 1882 *to* 1891 *inclusive.*

| OPERATIONS. | CASES UNDER TREATMENT. | | | | | | | | | | PERCENTAGE OF DEATHS. | | | | | | | | | | Total Number of | | Average Percentage of Deaths. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1882. | 1883. | 1884. | 1885. | 1886. | 1887. | 1888. | 1889. | 1890. | 1891. | 1882. | 1883. | 1884. | 1885. | 1886. | 1887. | 1888. | 1889. | 1890. | 1891. | Cases. | Deaths | |
| PRIMARY— | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh ... .. ... | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 100· | 100· | 50· | 100· | ... | 50· | ... | 50· | 100· | 100·* | 19 | 12 | 63·15 |
| Knee Joint ... ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... |
| Leg ... ... .. | 4 | 4 | 2 | 3 | 1 | 3 | 2 | 1 | 1 | 2 | 50· | 50· | ... | 33·33 | 100· | 66·66 | 50· | ... | ... | ... | 23 | 9 | 39·13 |
| Ankle Joint ... .. | 2 | ... | 3 | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 100· | ... | 8 | 1 | 12·5 |
| Shoulder Joint ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 100· | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 100· |
| Arm ... .. .. | 1 | 2 | ... | 4 | 2 | 2 | ... | 2 | 1 | 6 | ... | ... | ... | 25· | ... | ... | ... | 50· | 100· | ... | 20 | 3 | 15· |
| Forearm .. ... | 3 | 3 | 4 | 2 | 3 | 2 | 4 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 22 | ... | ... |
| SECONDARY— | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh ... .. .. | 3 | 1 | 1 | 5 | ... | ... | 4 | 1 | 3 | ... | 66·66 | 100· | ... | ... | ... | ... | 25· | 100· | 33·33 | ... | 18 | 6 | 33·33 |
| Leg ... ... ... | 1 | 3 | 1 | 3 | 2 | 1 | 1 | 1 | ... | ... | 100· | ... | ... | 66·66 | ... | 100· | ... | ... | ... | ... | 13 | 4 | 30·76 |
| Arm ... ... ... | ... | 2 | 2 | ... | ... | 1 | 1 | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 | ... | ... |
| Forearm ... ... | ... | 2 | ... | 3 | 1 | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 | ... | ... |
| Shoulder Joint ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... |

* *Foot also amputated.*

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## TABLE OF AMPUTATIONS, &c. (*continued*).

| OPERATIONS. | CASES UNDER TREATMENT. | | | | | | | | | | PERCENTAGE OF DEATHS. | | | | | | | | | | Total Number | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1882. | 1883. | 1884. | 1885. | 1886. | 1887. | 1888. | 1889. | 1890. | 1891. | 1882. | 1883. | 1884. | 1885. | 1886. | 1887. | 1888. | 1889. | 1890. | 1891. | Cases. | Deaths | Pc |
| FOR DISEASE— | | | | | | | | | | | | | | | | | | | | | | | |
| Hip Joint ... ... | 2 | 2 | 3 | 1 | 3 | ... | 1 | ... | ... | ... | 50· | ... | 33·33 | 100· | 66·66 | ... | ... | ... | ... | ... | 12 | 5 | 31·66 |
| Thigh ... ... ... | 15 | 23 | 27 | 20 | 12 | 25 | 15 | 13 | 7 | 13 | 13·33 | 8·69 | 18· | 10· | ... | 12· | 13·33 | 7·69 | 14·28 | 7·69 | 170 | 22 | 12·3 |
| Knee Joint ... ... | 1 | 1 | 1 | 1 | ... | 1 | 1 | 1 | ... | 2 | ... | ... | 100· | ... | ... | ... | ... | ... | ... | ... | 9 | 1 | 11·11 |
| Leg ... ... ... | 5 | 7 | 3 | 4 | 8 | 5 | 7 | 7 | 4 | 6 | ... | 28·57 | 33·33 | 50· | ... | 20· | 14·28 | 14·28 | ... | ... | 56 | 8 | 14·28 |
| Ankle Joint ... ... | 8 | 8 | 7 | 11 | 9 | 11 | 6 | 1 | 6 | ... | 12·5 | ... | ... | ... | 22·22 | 9·09 | ... | ... | 16·66 | ... | 67 | 5 | 7·46 |
| Shoulder Joint ... | ... | 1 | 2 | 1 | 1 | 1 | 1 | ... | ... | ... | ... | ... | ... | 100· | ... | ... | ... | ... | ... | ... | 7 | 1 | 14·28 |
| Arm ... ... ... | 1 | 2 | ... | 1 | 4 | 2 | ... | 2 | 5 | 4 | ... | ... | ... | ... | 25· | ... | ... | ... | ... | ... | 21 | 1 | 4·76 |
| Forearm ... ... | 2 | 3 | 4 | 2 | 5 | 5 | 2 | 4 | ... | ... | ... | ... | ... | 100· | 20· | ... | ... | ... | ... | ... | 27 | 3 | 11·11 |

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